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The Adolescent's Quality of Life in the Gaza Strip: Nutritional and Psychological Risk Factors

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Abstract

Currently, more in-depth interest had been paid globally to the issues relating to nutrition, growth, development and psychosocial well-being of children and adolescents. Hence, this research aimed to identify and assess the nutritional and psychological risk factors affecting the life quality of adolescents in the Gaza Strip in order to highlight and prioritize them for future interventions. There are four objectives in this study, the first is to determine and assess the risk factors associated with two different components of life quality of adolescents in the Gaza Strip, the second is to measure the extent of psychological disorders amongst adolescents affected by current lifestyle in Gaza, the third is to study in depth the effect of nutritional status in the Gaza Strip on adolescent's life quality, whilst, the fourth is to identify research gaps to set priorities for future relevant studies, that might encourage adolescent's behavioural changes. In order to achieve these objectives, the study population had been focused on adolescents (12-19 years old) who enrolled in the schools of the Gaza Strip during the academic year (2015-2016). The present Cross-sectional study utilized quantitative and qualitative measures by incorporating face to face interview questionnaire with adolescents and focus group discussion with parents and stakeholders. In addition, anthropometric measurements and micronutrients tests were conducted. Triangulation of data was used to ensure the credibility of the results.

The study findings revealed that (56.3%) of adolescents were eating healthy foods, where boys showed a little higher percentage (57.1%) than girls (55.5%). Precisely done anthropometric measurements proved that (7.9%) of adolescents were moderate to severely stunted. Based on body mass index, (22.8%) of the study participants were underweight, (12.7 %) were overweight while (3.2%) were obese.

Haemoglobin measurement revealed that (15.6%) of the study adolescents were anaemic. In gender terms, anemia affected (17.3%) of girls and (14.1%) of boys respectively. Meanwhile, iron deficiency was (23.3%) among the study participants being higher in girls (27.3%) than boys (19.9%). Vitamin D deficiency was (8%), whilst insufficiency of this vitamin was (35.3%). Zinc deficiency was the highest (36.7%) among the tested micronutrients, and the deficiency slightly higher in Girls (38.1%) than in boys (35.4%).

It's worth mention that, more than half of adolescents (57.7%) were living a sedentary life, being (85.5%) in girls compared to (34.1%) in boys. While (29.9%) of adolescents were active and very active, the percentage among boys was apparently higher than in girls being (49.8%) and (6.4%) respectively. The overall findings of psychological health and well-being dimensions demonstrate that (47.1%) of adolescents perceived depressed mood, where (46%) of them were anxious, and (45.5%) reflected poor psychology. Results of adolescent's quality of life illustrated that the total score of "money matter" domain of QOL among study population had the highest score (90.2%). On contrary, the lowest scores appeared in; "psychological well-being" and "moods and emotions" domains as (66.3%) and (67.1%) respectively, thus denoting congruent logical relevancy to the (44.2%) of adolescents who perceived their quality of life as poor.

The relationship between quality of life and food intake category was not statistically significant. Whereas, the relationship between adolescent's quality of life and their psychological status was high statistically significant (< 0.001).

Based on the study results, nutritional and psychological interventions were carried out to help adolescents who participated in the study and recommended as needy cases for intervention.

As per the study results, unprecedented reference data are now available in the Gaza Strip. They can be used for the purposes of addressing the adolescent's needs and help solving their nutritional and psychological problems, a matter that would undoubtedly improve their quality of life.

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Introduction

Background and Research Problem

Adolescence, which is a transitional period from dependent childhood to independent and responsible adulthood, is a particularly unique period of life characterized with intense physical, psychosocial, and cognitive growth and development [1]. Currently, more in depth interest had been paid globally to the issues relating to nutrition, development and psychosocial well-being of children and adolescents. They have received much attention, in terms of research, care, and policy [2]. Moreover, meaningful growing interest in assessing health-related quality of life (HRQOL) in children and adolescents is observed [3]. The thoughtful interest in this issue arises from the fact that interrelated unbreakable bonds between different adolescent's quality of life components are still not satisfactorily interpreted neither adequately addressed by the community, professionals and even adolescents themselves.

Health researchers and providers increasingly recognize the importance of obtaining information about adolescents' perspectives of their quality of life (QOL) [4]. It is generally considered as a multi-factorial construct focusing on individuals' subjective evaluations of their physical health, psychological health, nutritional health and social functioning, where these domains are distinct areas that are influenced by a person's experiences, beliefs, expectations and perceptions [5].

Research shows that adolescent' eating practices and nutritional intake may have long-term impact on health, where there is evidence that early childhood malnutrition, stunting, underweight, and anaemia are negatively associated with cognitive development, appropriate behaviour and academic attainment in later childhood [6-8]. Accordingly, if adolescents are well nourished, they can make optimal use of their skills, energies and talents today, and be responsible parents of healthy baby's tomorrow [9].

From another aspect, well-being is a positive outcome that is meaningful for people and for many sectors of society, because it tells us how people perceive that their lives are going well. Good living conditions (e.g., housing, employment) are fundamental elements to well-being. Tracking these conditions is important for public policy. However, many indicators that measure living conditions fail to measure what people think and feel about their lives, such as the quality of their relationship, their positive emotions and resilience, the realization of their potential, or their overall satisfaction with life. Moreover, well-being generally includes global judgments of life satisfaction and feelings ranging from depression to joy. The Palestinian society is apparently young evidenced with (61.7%) of total population in the occupied Palestinian territory being 0-24 years old. Adolescents whose ages range between 10-19 years old constitute (23.6%) of the total Palestinian population [10-12]. Despite adolescents are "future" of any geographical area, but the given situation of Gaza is not promising regarding opportunities of this new generation to create another history [13]. However, Palestinian youth face obstacles that stem from their large demographic size, where WHO quality of life-Bref (WHOQOL-BREF) study in 2005 concluded that the quality of life in the Palestinian territories is lower than in almost all other countries included in the study, while levels of fear and distress among the population were higher than in most other countries [14]. Regrettably, a very little attention has been paid to adolescents' quality of life in the Gaza Strip so far, and adolescent nutrition and psychosocial status has received inadequate consideration in research as well as in programming for adolescent health or other life aspects. According to need assessment study conducted by Mercy Corps International organization about marginalized female adolescents, revealed that focusing on adolescents in oPt as a separate age group with specific needs and rights, is a recent phenomenon [15].

A representative cross-sectional study on the Palestinian micronutrient status (PMS), prevalence and causes of anaemia, coverage and use of flour fortification, salt iodization was carried out in children (6 to 59 months), adolescents, pregnant and lactating

women. Improved methods of sampling and the use of precise biomarkers have made the outcome of PMS report as a reliable accurate source of information and eligible for use internationally about nutrition situation in the State of Palestine (PNA) [16].

A new study examining the conflict victimized adolescents in the Gaza strip has found that exposure to war-torn environments leads to lasting and detrimental effects on the mental health status of young people. The researchers found that a substantial number of adolescents in these situations could develop a range of long-lasting emotional and behavioural problems. Even before the current military offensive, youth in Gaza bore the mental scars of years under siege and previous episodes of bombardment [17]. Several instruments have been developed for the measurement of adolescents' QOL in order to examine the impact of health care interventions, supportive services, and health promotion initiatives [18].

An Irish study conducted as part of the KIDSCREEN project in order to develop a standardized health related quality of life instrument for children and adolescents. It aimed to validate the KIDSCREEN-52 health-related quality of life instrument for children and adolescents and to provide reference data on individual dimensions of the instrument. The instrument is a standardized generic cross-cultural instrument, which assesses children's opinions, attitudes and feelings about their perceived health. The findings provide reference data that can be used for the purposes of preventive health and well-being, provision of care and treatment, and management of healthcare services [19].

The current research will contribute to bridge the gaps about specific needs of this disadvantaged sector of population in Gaza especially, and could set research priorities for future relevant studies, besides measuring the extent of psychological disorders amongst adolescents affected with current life style in Gaza.

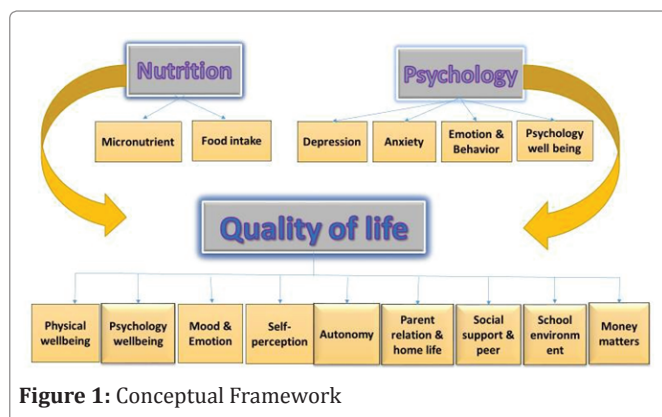
Justification of the study: The Palestinian community in the Gaza Strip is already victimized with long term vulnerability affecting all sectors, of them the adolescents were drastically influenced. Hence, addressing their needs, and solving their nutritional and psychological problems would undoubtedly benefit the entire society. Newly conducted researches proved high rates of micronutrient deficiency amongst school students where adolescents had been considerably presented. Furthermore, Palestinians at earlier and late childhood sectors demonstrated arguable biometric findings with higher tendency to stunting and negative nutritional habits. The findings included chronic nutritional disorders that had been meaningfully linked to different socioeconomic nutritional health determinants, and were negatively encroaching upon different life aspects. Prolonged exposure to stressful factors with inevitable psychological implications had been found to affect the adolescents in the Gaza strip resulting in different forms of fear and distress. Accordingly, this research highlights these rebellious problems and prioritizes the necessity for prompt long-term solution especially for descents that appeared to partially neglect even at applied research level.

Goal

To identify and assess the nutritional and psychological risk factors affecting the life quality of adolescents in the Gaza Strip in order to highlight and prioritize them

Specific Objectives:

- To determine and assess the risk factors associated with two different components of life quality of adolescents in the Gaza Strip.
- To measure the extent of psychological disorders amongst adolescents affected with current life style in Gaza.
- To study in depth the effect of nutritional status in the Gaza Strip on adolescent's life quality.
- To identify research gaps and set research priorities for future relevant studies in order to encourage adolescent's behavioural changes (Figure 1).



Terms of Reference

Adolescence: Adolescence is a period of life with specific health and developmental needs and rights. It is also a time to develop knowledge and skills, learn to manage emotions and relationships, and acquire attributes and abilities that will be important for enjoying the adolescent years and assuming adult roles [20].

Adolescents: The World Health Organization (WHO) defines adolescents as those people between 10 and 19 years of age. The great majority of adolescents are, therefore, included in the age-based definition of “child”, adopted by the Convention on the Rights of the Child as a person under the age of 18 years [21].

a. Well-being: There is no consensus around a single definition of well-being, but there is general agreement that at minimum, well-being includes the presence of positive emotions and moods (e.g., contentment, happiness), the absence of negative emotions (e.g., depression, anxiety), and satisfaction with life, fulfilment and positive functioning. In simple terms, well-being can be described as judging life positively and feeling good. For public health purposes, physical well-being (e.g., feeling very healthy and full of energy) is also viewed as critical to overall well-being [22].

b. Physical Well-Being: A state of physical well-being is not just the absence of disease. It includes lifestyle behaviour choices to ensure health, avoid preventable diseases and conditions, and to live in a balanced state of body, mind, and spirit (American Association of the Nurse Anaesthetists [23].

c. Quality of life: Quality of life (QOL) is a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life. What makes it challenging to measure is that, although the term “quality of life” has meaning for nearly everyone and every academic discipline, individuals and groups can define it differently [24].

d. Health-related quality of life: The concept of health-related quality of life (HRQOL) and its determinants have evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health; either physical or mental [25,26].

e. Psychological well-being: Psychological well-being is usually conceptualized as some combination of positive affective states such as happiness and functioning with optimal effectiveness in individual and social life [27]. As summarized by Huppert “Psychological well-being (PW) is about lives going well. It is the combination of feeling good and functioning effectively.” By definition therefore, people with high PW report feeling happy, capable, well supported, satisfied with life, and so on; Huppert review also claims the consequences of PW to include better physical health, mediated possibly by brain activation patterns, neurochemical effects and genetic factors [28,29].

f. Healthy Foods: It is referred to as the food which is beneficial for health in terms of nutrition and it also fits the body. Healthy food may be considered as organic food (pure from chemicals), whole foods and natural food [30].

g. Unhealthy Foods: The best way to describe unhealthy food is the less nutritious food containing high amount of calories, fat and

sugar. This type of food is also highly rich in protein, which should be given in a particular amount despite its precious value to the body [30].

Methodology

Study Design

Cross-sectional study with combination between quantitative and qualitative methods was conducted to identify and assess the nutritional and psychological risk factors affecting the life quality of adolescence (12-19 years old) in the Gaza strip.

Study Population

The sample frame is all Adolescents aged 12- 19 years; who were enrolled in the schools in the Gaza Strip (Governmental and Private schools) during the academic year 2015-2016, amounting to 204,888 (MoE = 232,186, Private = 16,637).

Sample Size

Using Epi info indicated that at 95 confidence intervals with proportion (30%) of the estimated problem, and with worst estimate (35%), the sample size was 323 individuals, and it was increased up to 400 in order to compensate for the non-respondents. The 378 adolescents shared in the study with a response rate of (94.5%).

Study Setting

Data were collected from governmental and private schools in all of the Gaza Strip governorates.

Sampling Process

Proportional stratified cluster random sampling technique was used to determine the targeted schools in each governorate. Convenient sample was used to identify the schools participating in the study. Then, the study population in these schools was separated into different strata (Governmental and private schools, preparatory and secondary schools, Girls and boys).

The sample is conveniently depending on the number of students in each school, and its size was selected considering the total number of governmental and private schools in each area. Accordingly, out of the 392 governmental and 56 private schools, 12 and 6 schools were included in this study respectively. Accordingly, 265 students (boys and girls) were collected from 12 governmental schools, and similarly, 135 students from 6 private schools. All students were selected systematically from the students’ name list in each school, with total study respondents 378 (205 boys, 173 girls) who were selected from and distributed as follows; 4 governmental schools from the northern area with 2 for girls and 2 for boys (elementary and secondary school) and one private school with boys and girls together within mixed preparatory and secondary school system, 4 governmental schools from the Gaza area with 2 for girls and 2 for boys (elementary and secondary schools) and 2 private schools with combined boys and girls within mixed preparatory and secondary school system, from the middle area 2 governmental secondary schools and one private school were selected with combined boys and girls within mixed preparatory and secondary school system, and 2 governmental (elementary and secondary schools) and 2 private schools were selected (one for boys and one for girls, mixed between elementary and secondary).

Data Collection

The objectives were achieved by using face to face interview questionnaire which covered different themes such as (socio-demographic, physical activity, nutrition, psychology, and quality of life of adolescents). Blood tests including; Complete Blood Count (CBC), vitamin A, vitamin D, Iron, and Zinc were carried out. Furthermore, anthropometric measurements including; weight and height were also made. Blood pressure was measured, in addition to the performed focus group discussion with p

Anthropometric measures: All measurements were performed at the same time of the day (between 8 Am -2 Pm) for all participants. Height was measured in centimetres (cm) to the nearest 0.5 cm using a stand-meter eight measurement tool (SECA) with the participant

standing in an upright position without shoes. Body weight was measured to the nearest 0.2 kilogram (kg) using a digital scale (SECA) with the participant standing in an upright position without shoes and in light clothing. Duplicate readings of height and weight were taken and the average was the participant's actual measurement. Following at least five minutes of rest in a comfortable seated position, blood pressure (BP) was measured on the right arm using a standard mercury sphygmomanometer with an appropriate cuff size.

The anthropometric indicators were classified in accordance with Cut-off values of WHO Anthro-Plus reference 2007 for 5-19 years to monitor the growth of school-age children and adolescents [31] (Table 1).

Stunting: In this study, stunting is defined as low height-for-age using the z-score or "standard \geq deviation" cut-off point of <-2 SD of the mean of National Centre for Health Statistics (NCHS) standard. Severe stunting is defined when the values obtained are <-3 SD of the same reference standard [32].

Blood specimen collection: Venous blood samples were collected for each student at his school after the interview questionnaire. 5 ml of random (non-fasting) venous blood sample had been collected safely from the forearm vein via venepuncture (using a disposable sterile syringe and stainless steel needle 23 G). An amount about 3 ml of the collected blood was placed in a coded red capped vacutainer collecting tubes for vitamins, serum zinc, and iron analysis. The rest of the blood sample, (2 ml) was placed in a coded EDTA tube for measuring other blood indices including haemoglobin concentration via Complete Blood Count test. The vacutainer collecting tubes were directly kept in a cold keeping container (2-8 °C) and were conveyed cautiously to the laboratory. The blood samples received by the laboratory were all perfectly prepared and dealt with professionally.

Vitamins D and A: Vitamin D testing was done for 150 students only, out of the entire study population and they were selected via randomized systematic technique. Vitamin D was tested in Palestinian Medical Relief Society laboratories in the Gaza Strip where serum (25-OH Vitamin D3/D2) concentrations were measured by:

ORGENTEC Diagnostic Germany - GmbH (Alegria),

The standard range for Vitamin D (25-OH Vitamin D3/D2) is:

ORGENTEC Diagnostic Germany - GmbH (Alegria), The standard range for Vitamin D (25-OH Vitamin D3/D2) is:	
Deficiency	$<12\mu\text{g/ml}$
Insufficient	$12-20\mu\text{g/ml}$
Sufficient	$>20-160\mu\text{g/ml}$

Meanwhile, vitamin A was analysed in Islamic university laboratories in the Gaza Strip via HPLC device. The standard range used for vitamin A was: 316 - 820 $\mu\text{g/l}$.

Iron and Zinc analysis: Serum iron analysis was carried out for 300 students from the study population in Palestinian Medical Relief Society laboratories in the GS. Measurement of serum iron is based on colorimetric method by using computerized chemical chemistry auto-analyser equipment (Response 920). Serum iron deficiency was considered at values of 35-140 $\mu\text{g/dl}$ for both boys and girls (DiaSys-Iron- Metabolism-Flyer-ENG-2013). Serum zinc level for 300 students of the study population was made in Palestinian Medical Relief Society laboratories in the GS. Zinc measurement was based on colorimetric method by using computerized chemical chemistry auto-analyser equipment (Response 920).

The lower cut-off values for serum zinc concentrations were 60 -110 $\mu\text{g/dl}$ for both boys and girls. (QCA, 2016).

Haemoglobin: Haematological parameters used for the assessment of anaemia prevalence and characterization of anaemia types were; haemoglobin (Hb), red blood cell count (RBC), haematocrit (Hct), erythrocyte mean corpuscular volume (MCV), erythrocyte mean corpuscular haemoglobin (MCH) and erythrocyte mean corpuscular haemoglobin concentration (MCHC). Those parameters were tested for all study population via computerized (CBC) analyser (Orphee-Mythic 18) (Table 2).

Body built	Indicators	Anthropometric	Cut-off values in
	"BMI"	variables	percentile
Thin/under weight	Low	$<18.5\text{ Kg/m}^2$	$< 5^{\text{th}}$
Normal	Normal	$18.5 - 24.9\text{ Kg/m}^2$	$5^{\text{th}} \geq - < 85^{\text{th}}$
Overweight	High	$25 - 29.9\text{ Kg/m}^2$	$85^{\text{th}} \geq - < 95^{\text{th}}$
Obese	Very high	$\geq 30\text{ Kg/m}^2$	$\geq 95^{\text{th}}$

Table 1: Anthropometric cut-off points according to WHO standards

Population	Non-anaemic	Anaemic		
	Classified by Hb as gm/dl	Classified by Hb as gm/dl		
	gm/dl	Mild	Moderate	Severe
12-14 years Boys & Girls	≥ 12	11.9-11	10.9-8	<8
15 & more Boys	≥ 12	11.9-11	10.9-8	<8
15 & more Girls	≥ 13	12.9-11	10.9-8	<8

Table 2: Classification of anemia by WHO (2011) cut-off values of haemoglobin

Face to Face Interview Questionnaire: Face to face interview questionnaire was adopted from different references namely [32-40]. The questionnaire was then modified according to the study objectives and Gaza context. Personal identification numbers were assigned to each participant in order to maintain anonymity. The identification number was used to confirm consent status and to link students to their respective schools. The questionnaire covers different issues/themes about nutrition, food intake, and physical activity. Other topics were also considered including all psychological domains components such as; depression, anxiety, emotional and behavioural, and psychology wellbeing. In addition, the quality of life domains included; physical wellbeing, psychological wellbeing, mood and emotion, autonomy, self-perception, school environment, parent's relations and home life, social support and peers besides money matter. The questionnaire was reviewed and revised several times to include all factors of interest. The questionnaire was validated by competent experts and data was collected by well-trained team. The team visited respondents at their schools in order to fill the questionnaires, collect the venous blood samples and perform anthropometric measurements.

A. Food intake: Food intake was assessed where adolescents completed a food frequency questionnaire (20 indicator variables) that measured their consumption of milk, eggs, beverages, sweets, cake/cookies, Chinese noodles (Endomy), chips, fast food, canned food, vinegary food, silly and or spicy foods, roasted food (Shawerma), fried foods and oil, dried fruits, cooked vegetables, lemonade and or soft drinks, meat/sausage products, chicken meat, fish/sea foods, dairy products and cereals.

The instrument was created to include food categories such as; healthy and unhealthy foods that are important when studying dietary habits. The introductory question, "How often do you eat the following foods?" was asked to students about the frequency of their usual consumption of each food group separately (rated on a 5- point scale: several times a day, daily, several times a week, 1-2 times a month, and never) [41].

B. Physical activity pattern: The participants were asked how often they practice a specific leisure activity and how long did they practice it in each time. The response categories were sorted as; daily, weekly and minutes in each time. Different classifications were used to describe physical activity. In this study, physical activity was classified according to the time spent and type of physical activity. All times spent in each specific daily physical activity over 24 hours were

summed up to each other. The obtained number was multiplied by a specific factor for each physical activity. The net result was added to 1.1 in order to give a specific score [42]. According to this score, the physical activity was classified into (1) Sedentary, (2) Low active, (3) Active and (4) Very active (Table 3).

C. Psychological dimension: Psychological health and well-being scale in this study included 4 dimensions; Depression; Anxiety; Behavioural and emotional control; and Psychological well-being. The dimensions used with efficacy to assess people's overall psychological well-being.

a. Depression Domain (30 items): This dimension explores the perceived depression status of adolescents in terms of their feeling. They were expressed within their negative and positive feelings and the signs of somatic disease they have been feeling.

b. Anxiety domain (12 items): This domain explores the level of anxiety for the adolescents, the questions addressed how much adolescents experience negative feelings about anxiety such as; worrisome, nervousness, hard to enjoy life, annoyed and so on. They also reflect the adolescent somatic complain in the past 2 weeks prior to filling the questionnaire.

c. Behavioural emotional control domain (16 items): This domain reveals the ability of adolescents in controlling their behaviours and emotions, it also reflects the burden student feel in different sides of life such as study, exams, problem with peers and family and isolation.

d. Psychological wellbeing domain (21 items): This dimension covers the positive feelings of adolescents that reflect their happiness, relaxation, feeling peacefully, optimism and interest in life.

D. Quality of life: This QOL domain is adopted and modified from KIDSCREEN-52 instrument, this instrument is a European-wide effort, covering 13 countries, the present study aimed to apply the KIDSCREEN-52 health-related quality of life instrument for adolescents in Gaza and to provide reference data on individual dimensions of the instrument. The instrument was translated into Arabic and reviewed by the study researchers. The instrument is a standardized generic cross-cultural instrument, which assesses adolescent's opinions, attitudes and feelings about their perceived health. The findings from this study provide reference data that can be used for the purposes of preventive health and well-being, provision of care, treatment, and management of healthcare services. This information is of significant value for people working with young people in their capacity as educators, researchers, health providers, social workers, policymakers, health service planners, managers and health promoters. It is also of interest to parents and adolescents themselves (Keenaghan & Kilroe, 2008).

The KIDSCREEN-52 instrument measures 10 health-related quality of life (HRQOL) dimensions, but in the present study, one dimension irrelevant to the context (social acceptance and boyfriends' relationships) was excluded. The other dimensions are addressing the following main areas:

Physical activity description	Level score
Sedentary	1.0 to 1.39
Low active	1.4 to 1.59
Active	1.6 to 1.89
Very active	1.9 and above

Table 3: Physical activity levels

No.	Dimensions	No. of items	Cronbach's Alpha
1.	Food intake	20	0.589
2.	Quality of life Domain	45	0.855
3.	Psychological Domain	79	0.884

Table 4: Reliability estimations of the domains

- Physical well-being** (7 items): This explores the level of physical activity, energy and fitness of the child or adolescent.
- Psychological well-being** (6 items): This examines the psychological well-being of the child/adolescent, including positive emotions and satisfaction with life.
- Moods and emotions** (7 items): This covers how much the child/adolescent experience depressive moods and emotions, and stressful feelings.
- Self-perception** (5 items): This explores whether respondents perceive their bodily appearance positively or negatively; body image is explored by questions concerning satisfaction with looks as well as with clothes and other personal accessories.
- Autonomy** (2 items): This looks at the respondent's opportunities to create social and leisure times.
- Parent relations and home life** (3 items): This examines relationships with parents and the atmosphere at home.
- Social support and peers** (4 items): This examines the nature of the respondent's relationships with other children/adolescents.
- School environment** (9 items): This explores the perception of child/adolescent about cognitive capacity, learning and concentration, and their feelings at school.
- Money matter** (2 items): This assesses respondents' perceptions of their financial resources.

It's worth mentioning that prior to the analyses, the nine domains of the QOL measures were recoded into two categories "good" and "poor" as dependent variables. Regarding each domain of the QoL, for example physical well-being domain, the first three response options (Always, very often, and quiet often) were combined to derive the measure "good" the latter two responses (seldom and never) were combined to derive the measure "poor" overall physical well-being domain. Then other eight domains were also dichotomized for use in logistic regression analyses. Dependent variables were the domains of the QoL measure, with "0" for good QoL and "1" for poor QoL.

Focus group: Five focus group sessions were held, two with mothers, one with parents, and two with consultants and stakeholders from UNRWA, Ministry of Education, governmental and non-governmental organizations in order to collect data about the main life style behaviours of adolescents inside their homes or schools, challenges and the suggested solutions to improve the adolescent's quality of life in term of nutritional and psychological risk factors, and overcome the research problem. This session was conducted after the preliminary results of the questionnaires to obtain more clarifications and accurate results.

Preparation for field work

A training workshop was held for the team members prior to data collection, at Ard-El Insan association center. Training was conducted by qualified trainers and it involved:

- Research objective and goal
- Explanation about the questionnaire
- Face to face interview criteria
- Study population
- Blood sampling protocols
- Blood presser measurement protocols
- Weighing and length measurement protocols.

Pilot study

The researchers conducted a pilot study by selecting one secondary school, 25 adolescents were randomly selected and filled the questionnaire with them. Exclusion the participant and the selected school from the study was done and the result of the pilot study wasn't included in the real study results. The results of pilot study were helpful in applying modifications on the questionnaire in attempt to strengthen the study tools and obtain more accurate results.

Data analysis

Mixed methods were applied in order to provide a combination between quantitative (face to face interviewed questionnaire) and qualitative paradigm (Focus groups). Then, triangulation was

adapted by combining both quantitative and qualitative approach. This combination aimed at ensuring preciseness of findings, in order to obtain in-depth answers that could help propose effective solutions.

For Quantitative data: Data were analysed using a software Statistical package for science (SPSS version 24). Many different statistical tests were used through frequency of the study items, description of the study population. Mean, standard deviation and cross tabulation of the results were used to demonstrate the study items. Appropriate advanced statistical analysis was conducted in order to explore the potential relationship between variables. Therefore, an independent T-test, Chi-square were carried out to investigate the relationship between the study variables. Statistical significant relations were considered at P-Value less than 0.05.

For Qualitative data: The main data collected from the focus group discussion with mothers, parents, consultants and stakeholders from UNRWA, Ministry of Education, governmental and non-governmental organizations were analysed as the following:

- a) Data were tape-recorded and transcribed.
- b) The interviewer made notes of key points arising and verbatim quotes.
- c) Manual thematic content analysis of transcripts and interview notes were applied.
- d) Qualitative questions were analysed using deductive approach in the Qualitative Data Analysis (QDA).
- e) Coding scheme and coding the data by relevant labels and categorization were created.

Quality assurance measures

- a) Piloting was implemented to ensure the validity and reliability of the research questionnaire.
- b) Once the quantitative data were obtained via the survey, the data were cleaned, checked for missing values, inconsistencies and any other response errors.
- c) A coding manual was constructed which contained general instructions on how each variable was coded.
- d) The coded data were rechecked visually for the detection of any possible data entry errors. Descriptive statistics were computed for all the variables for accuracy of inputs as follows: the range of each variable was checked for out-of-range values; frequency counts were performed; the distribution of each variable was analysed to detect irregular answers and cases with extreme values; and the means and standard deviations were computed.
- a) Data were cross tabulated and frequency to ensure data consistency and eligibility.
- b) Reliability: Persistence coefficient way (Cronbach Alpha test) was used to ensure that the measure has elevated stability.

Validity

Face Validity: The importance of making people more respondent to the study questionnaire has made the researcher to check the face validity twice time, the first during the pilot study as the participants were asked about the structure of the questions, it's shape, and typing clearance. The second check was through expert persons who gave their opinion in the face validity of questionnaires.

Content Validity: Content validity is subjective estimation of measurement based on judgment rather than statistical analysis, in order to validate the instrument used. It was done before data collection, by sending the questionnaires with covering letter and paper contain instruction about the study, over all aim, objective, field of study and other relevant information.

The researcher sent the questionnaires to 10 experts from difference backgrounds including nurses, doctors, expert in management, university educationist, psychologist, and researchers. They were asked to estimate the questionnaires in term of relevancy to the study, clarity, and completeness of each items. Feedback was obtained from 6 experts, and modifications were made considerably in accordance with their opinions.

Reliability

The statistical test used for the internal consistency was Cronbach's Alpha coefficient. Cronbach's Alpha is designed as a measure of internal consistency, that is, do all items within the instrument measure the same thing [43]. Cronbach's Alpha is used to measure the reliability of the questionnaire for each dimension. The normal range of Cronbach's Alpha value is between zero and one. The closer the Alpha is to one, the greater the internal consistency of items in the instrument being assumed.

The questionnaire is considered reliable, and ready for distribution for the intended sample.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- a) All adolescents of age group (12-19) years who enrolled in governmental and private schools in the Gaza strip.
- b) All adolescents whom their parents signed the consent form and agreed upon participating their children in the study.
- c) All adolescents who agreed verbally to participate in the study.

Exclusion Criteria:

- a) All adolescents of age group (12-19) years who are not enrolled in governmental or private schools in the Gaza strip.
- b) All adolescents with different types of disability.
- c) All adolescents whom their parents rejected to sign the consent form.

Ethical matters

- a) An official letter of approval to conduct the research was obtained from the Helsinki Committee-Gaza Strip (Ethical committee).
- b) Official approval was obtained from the Ministry of education and higher education to conduct the study on the adolescents.
- c) Consent form was signed by the adolescents' parents.
- d) Every participant in the study received a complete explanation about the research purposes and confidentiality of information.
- e) Every participant in the study knew that participation in the research is optional.
- f) All the relevant ethical concepts were considered: Considering adolescent's privacy and respect of truth.
- g) Anonymity and confidentiality were maintained.

Limitation of the study

- a) Delayed agreement with the donor has resulted in postponing the start date of actual research activities and rendered them contemporary with students' preparation phase of their final exam of the academic year.
- b) Decrease of the original budget in the proposal and the unexpected increase of micronutrient's analysis cost had enforced the researchers to reduce the number of students designated for testing.
- c) Sampling was limited to governmental and private schools because UNRWA opposed conducting the research in their schools.

Strategy for intervention

Nutritional intervention: Analysis results and their normal reference values were reported individually and the tested adolescents were classified in accordance with obtained results as; low or deficient ranges of Hemoglobin, Iron, Zinc, Vitamin D, BMI and stunting.

Psychological Intervention: According to Kessler scale, cases were identified and categorized into mild, moderate and severe psychological well-being distress.

The number of psychological wellbeing questions which were included in the questionnaire was 89 questions with 5 Likert scale (Always, very often, Quite often, seldom, never). It was recoded into three scales (Always and very often = 1, quite often and seldom =

2, never = 3). Summation of the adolescents' 89 negative answers (Always and very often = 1) was measured and its frequency was categorized into mild (40%), moderate (50%) and severe (59% and above) (Kessler, 2002). Adolescents who rated moderate and severe (45% answers and above) were selected to get benefit from early intervention and psychological relief in order to prevent future mental health issues.

Results and Discussion

The study examined the adolescent's quality of life in the Gaza strip: nutritional and psychological risk factors. It intended to identify and assess the nutritional and psychological risk factors affecting the life quality of adolescents in the Gaza Strip in order to highlight and prioritize them, and to provide recommendation to policy makers in order to improve their status.

This chapter presents the results and discussion of the analysis of both quantitative and qualitative data besides the characteristics and distribution of respondents.

It comprises descriptive data about; nutrition, food intake, micronutrient prevalence (vitamin A & D, Iron and Zink), haemoglobin level, body mass index, physical activity, psychological domains including; (depression, anxiety, emotional, behavioural, and psychology wellbeing), quality of life domains (physical well being, psychological well being, mood and emotion, autonomy, self-perception, school environment, parent relation and home life, social support and peer, many matter).

Chi-square and t-independent test were used to explore the statistical differences between the dependent variables and independent variables. This chapter explores inter-relationships between the study variables such as; sociodemographic variables, nutritional variables, and psychological variables in addition to the quality of life. Inferential statistical results are illustrated in this chapter which includes risk factors for nutrition and psychology and their effects on the adolescent's quality of life.

Focus group sessions were held with parents, consultants and stakeholders from UNRWA, Ministry of Education, governmental and non-governmental organizations in order to collect data about the main life style behaviours of adolescents inside their homes or schools, challenges and the suggested solutions to improve the adolescent's quality of life in terms of nutritional and psychological risk factors, and overcome the research problem. This session was conducted after the initial results of the questionnaires in order to obtain more clarifications and accurate results.

Descriptive Results

Sociodemographic characteristics: The 378 adolescents include both boys (54.2% and girls (45.8%) (Figure 2).

Regarding participants' age, (40.3%) of them ranged between 12-14 years old and the highest percentage (58.7%) was amongst the age group (14-17 years) whilst the lowest percentage (0.8%) was amongst the ones aged 17 years and more (Figure 3).

As shown in (Figure 4), the adolescents participating in the study were from the following five Gaza Strip governorates as presented by percentages respectively; The Northern governorate (27.2%), Gaza governorate (35.4%), Middle governorate (12.7%), Khanyounis governorate (9.8%) and Rafah governorate (14.8%).

As illustrated in the above (or) below (Table 5), about (53.2%) of participants were in preparatory schools and (46.8%) were in secondary schools. As Palestinian people are generally educated, both parents in this study showed high percentage of high education, where mothers surpassed fathers as (74.7%) and (69.1%) respectively. About (72.2%) of fathers work and only (10.1%) of the adolescent' mothers are working. The majority of students (96%) were living in their own family house, while (4%) of them live in rented houses. About (62.4%) of participants family numbers ranged from 7 to 10 persons. The reported academic achievement for more than half of the students (58.5%) was very good and above. The majority (94.4%) of adolescents stated that they take pocket money and (88.2%) of them were satisfied about their pocket money.

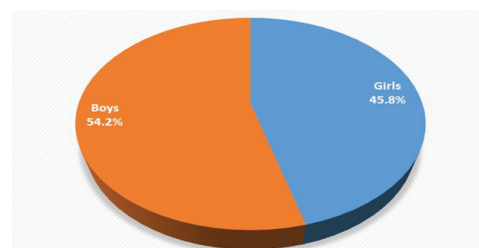


Figure 2: Distribution of the study population by Gender

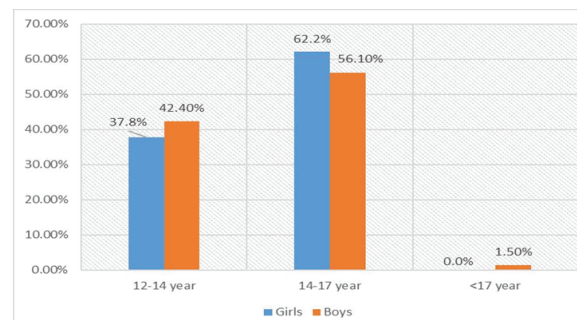


Figure 3: Distribution of adolescent by age group

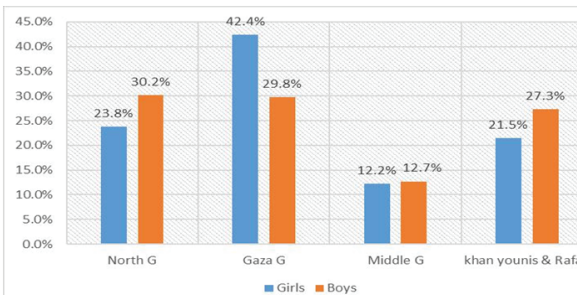


Figure 4: Distribution of adolescents according to place of residency

Variable	Category	Boys		Girls		Total	
		No.	%	No.	%	No.	%
Class grade	Elementary	98	47.8	103	59.5	201	53.2
	Secondary	107	52.2	70	40.5	177	46.8
No. of	>6	61	29.8	45	26.6	106	28.3
Family	7-10	122	59.5	111	65.7	234	62.4
members	>11	22	10.7	13	7.7	35	9.3
Academic achievement	50%-59%	15	7.3	8	4.6	23	6.1
	60%-69%	41	20.0	16	9.2	57	15.1
	70%-79%	56	27.3	21	12.1	77	20.4
	80% and more	93	45.4	128	74.0	221	58.5
Father education	Illiterate	7	3.5	4	2.4	11	3.0
	Low <12	46	22.9	46	27.9	92	25.1
	High > 12	148	73.6	115	30.4	263	69.1
Mother education	Illiterate	5	2.5	6	3.5	11	2.9
	Low <12	43	21.2	41	23.8	84	22.4
	High > 12	155	76.4	125	72.7	280	74.7
Father job	Yes	147	71.7	126	72.8	273	72.2
	No	58	28.3	47	27.1	105	27.8
Mother job	Yes	19	9.3	19	11.0	38	10.1
	No	186	90.7	154	89	340	89.9
Pocket money Satisfaction	Yes	191	93.2	166	96.0	357	94.4
	No	14	6.8	7	4.0	21	5.6
	Enough	171	88.1	153	88.4	324	88.2
	Not enough	23	11.9	20	11.6	43	11.7

Table 5: Distribution of participant regarding to sociodemographic characteristics

Nutritional Status of Adolescents

Adolescents' Nutritional Behaviour: As shown in about (58.5%) of participants said that they received nutritional education, where girls reported higher percentage than boys with (67.6%) to (50.7%) respectively (Table 6). Around half (49.2%) of participants mentioned eating meals three times a day, boys were more than girls in this category. The lowest percentage was among participants who eat one meal only per day, and girls showed higher percentage than boys in this category. Furthermore, boys (19%) were higher than girls (8.1%) in eating four meals and more per day. About (30.4%) of participants were skipping breakfast all the times, while (18.4%) where sometimes skipping it, girls (35.8%) were more than boys (25.9%) in skipping breakfast. The major cause of skipping was no appetite as reported by (56.5%) of the participants, and girls constituted higher percentage (59.7%) compared to boys (13.7%). Within the same context, (4.3%) of adolescents reported being on diet, and the girls were more than boys. The boys reported higher percent (45.3%) in no time for breakfast than girls (33.9%). Referring to what reported by the adolescent's parents who participated in the focus groups discussion, most of parents (mothers and fathers) mentioned that change in their sons and daughter's life style mainly in their food intake began after the start of their adolescence (teenage period).

Generally, most of parents mentioned that their adolescents take breakfast before going to school but in holidays there is no control due to disturbance in their sleep and wake up style. On one hand, only few mothers said that they already don't take breakfast themselves and similarly their sons and daughters do the same. On the other hand, some mothers declared that their adolescents prefer to skip breakfast and instead to buy it from the school's canteen. Accordingly, parents confirm the results obtained from adolescents about skipping breakfast, which required more attention by decision makers towards the school's canteen content and to focus on awareness about the importance of breakfast.

"I'm keen to ensure they take breakfast before going to school" (mother of an adolescent)

"I prepare sandwiches for children to take it with them to school, but my teens don't agree to take it, they say that they are not children, they buy from canteen" (mother of an adolescent)

"Taking Sandwiches to school embarrasses them, that's why they don't take it" (A mother repeated what her adolescents' boys and girls say)

"I'm obese and then my daughters don't like to eat in order to avoid obesity" (mother of an adolescent).

It's worth to mention that, school's health managers and teachers from both ministry of education and UNRWA who participated in the focus groups discussions, confirmed that they have different programs and curriculum for health and environment, which include full information about nutrition and healthy foods in addition to the importance of breakfast. Also, they mentioned that generally they do different non-curricular activities and meetings with students as well as their parents aiming at educating them about the importance of breakfast from health and psychological side

"Skipping breakfast affects adversely the student's psychology and makes him/her introvert (unsocial) and not active with teacher" (school health teacher) "Skipping breakfast leads to bad mouth odour, which makes their peers to be away from them" (school health teacher)

"It's difficult to think mathematics questions while your stomach is empty" (Educational directing and guidance officer at URWA)

Although there are different programs at school in both ministry of education and UNRWA related to nutrition, still there is a need for improving adolescent nutritional practice.

In comparison with others findings, these results are lower than a local study on adolescents aged 15-18 years skipping their breakfast. It reported that (60.8%) of student were skipping breakfast and (71.2%) of students were eating only 1-2 meals/day [44]. In a study on women at reproductive age, the findings demonstrated that (48.1%) of them have regular meal habits as three times daily, while only (5.2%) used to eat one meal only per day, and (47.2%) confirmed that they usually skip breakfast [45]. Out of those women (58.9%) attributed skipping breakfast to loss of appetite. Meanwhile, (12.2%) owed skipping breakfast to be on diet, whilst (28.9%) attributed it to shortness of time. Thus, it could be concluded that skipping breakfast is a common bad habit between mothers, and not only amongst adolescents.

Globally, emphasized that skipping breakfast is relatively common among children in the U.S. and other industrialized nations and is associated with quantifiable negative consequences for academic, cognitive, health, and mental health functioning [46]. Participants in focus group from school health department at UNRWA mentioned that according to their evaluation report before and after distributing meals among the students, there was improvement in the level of their academic achievement as well the disappearance of the violence among them.

"We distributed a healthy meal among the UNRWA schools' students for four years, and we noticed that the level of the violence decreased as well their academic achievement was improved" (UNRWA school health director)

"I observed that when I ask most of students who come to my office and complain from headache, they mention that they didn't take breakfast or even eat anything before coming to school" (School health teacher from Secondary school for girls at MoE)

From the other hands, about (95.2%) of the present study participant reported that they always take meals with their family with slight differences between boys and girls, around half of them (45.2%) mentioned that they always take their meals in front of TV (See Table2). The majority of parents confirmed that generally they take meals with their family members.

"I used to eat the three meals with my family members" (A father of adolescents)

"I do my efforts to share with my family members in eating the three meals" (A father of adolescents)

Regarding the importance of eating healthy food from adolescent's perspective, about (82.8 %) of the participants asserted that it is very important, while (17.2%) of them see it is not important. Boys were higher (89.8%) than girls (74.6%) in considering it as very important.

In contrast to these Figures, the majority of parents asserted that there is variation in food intake between girls and boys, but girls are better than boys in concerning with healthy food, except few mothers said that their boys concern with healthy food more than their girls.

"Girls are more concern with their healthy food more than boys" (A mother of adolescent)

"Boys aware about the importance of eating healthy food, but in practice they don't like most of healthy food" (A mother of adolescent)

"I try to control my adolescent son as I can to avoid more obesity, there is two main meals only, and there are only small sandwiches on dinner, If I make full meal he will eat a lot up to 8 full pieces of bread" (A mother of adolescent)

In the Minnesota, USA, adolescent who participated in a focus group which was conducted by (Croll et al., 2001) reported that healthy eating was not important to teens as a group, while a few students reported that healthy eating was important to them. Sometimes, healthy eating became important as the result of some nutrition and health education, although there were no strong differences in perceptions of healthy and unhealthy foods and eating habits between girls and boys, adolescent boys tended to focus more on energy and appetite when describing healthy eating, whereas girls tended to focus more on appearance as a motivator for healthy eating.

Assessment of Food Intake among adolescents: (Table 7) illustrated that about (68%) of the adolescent have drink milk in low frequent, and only (27.8%) of them have eat egg in low frequent. This result reflected better percentage among adolescents at Gaza; in drinking milk when compared with findings of another local study which pointed out that only (4.1%) and (17.3%) of boys and girls drank milk [47] (Table 7).

****Responses for this questions are** Several times a day, several times a week, 1-2 times a month, never and categorized into (Low frequency= 1-2 times a month, Never, High frequency= Several times a day Daily, several times a wee

From the other hand, (73.5%) of the study' adolescent drink lemonade with high frequent, while (67.2%) of them drink beverages with high frequent. Only (10.1%) of them eat dried fruit, about (57.7%) of them reported that they eat meat, chickens (76.2%) and dairy product (75.9%) with high frequent as shown in Table above. It is worth to mention that adolescents eat healthy food with high frequent as well they eat unhealthy food as shown above. High percent were reported for eating chips (73%), fried food (72.8%), sweets (71.2%) and cookies (67.5%).

Regarding Chinese noodles "Endomy", most the mothers said that their adolescents are addicted on the "Endomy", while few of them mentioned that newly there is decreasing in this addiction even they still like it.

"Adolescents are addictive on eating Endomy; it is a fashion between them" (A mother of an adolescent)

		No.	%	No.	%	No.	%
Nutrition	Yes	104	50.7	117	67.6	221	58.5
education	No	101	49.3	56	32.4	157	41.5
No. of meals/ day	One	4	2.0	18	10.4	22	5.8
	Two	48	23.4	69	39.9	117	31.0
	Three	114	55.6	72	41.6	186	49.2
	Four& more	39	19.0	14	8.1	53	14.0
Skipping breakfast	Yes	53	25.9	62	35.8	115	30.4
	No	111	54.1	81	46.8	192	50.8
	Sometime	41	20.0	30	17.3	71	18.8
	On a diet	1	1.9	4	6.5	5	4.3
Cause of skipping	No time	24	45.3	21	33.9	45	39.1
	No appetite	28	13.7	37	59.7	65	56.5
Eat your meals	Always	194	94.6	166	96.0	360	95.2
with family	Never	11	5.4	7	4.0	18	4.8
Take your meals	Always	95	46.3	76	43.9	171	45.2
while watching TV	Never	110	53.7	97	56.1	207	54.8
Importance of	Very important	184	89.8	129	74.6	313	82.8
Healthy food	Not important	21	10.2	44	25.4	65	17.2

Table 6: General Information about the adolescent's nutritional Behaviour

Answer	High Freq		Low Freq		M	RII
	Freq	%	Freq	%		
Milk	121	32	257	68	1.68	0.84
Egg	273	72.2	105	27.8	1.28	0.64
Beverages	254	67.2	124	32.8	1.33	0.66
Sweets (chocolate, candy)	269	71.2	109	28.8	1.29	0.64
Cake/cookies	255	67.5	123	32.5	1.33	0.66
Chips	276	73	102	27	1.27	0.63
Chinese Noodles (Endomy)	77	20.4	301	79.6	1.8	0.9
Fast food/canned food (pizza, beef burger)	101	26.7	277	73.3	1.73	0.87
Vinegary food	143	37.8	235	62.2	1.62	0.81
Silly & spicy food	191	50.5	187	49.5	1.49	0.75
Roasted food (Shawerma)	157	41.5	221	58.5	1.58	0.79
Fried food and oil	275	72.8	103	27.2	1.27	0.64
Dried fruit	38	10.1	340	89.9	1.9	0.95
Cooked vegetables	278	73.5	100	26.5	1.26	0.63
Lemonade/soft drinks	278	73.5	100	26.5	1.26	0.63
Meat/sausage products	218	57.5	160	42.3	1.42	0.71
Chicken meat	288	76.2	90	23.8	1.24	0.62
Fish/sea food	148	39.2	230	60.8	1.61	0.8

Table 7: Food intake frequency

Dairy/dairy products	287	75.9	91	24.1	1.24	62%
Cereals	223	59	155	41	1.41	71%
Total					1.45	73%

***Hint:** M=Mean of answers, RII=Relative Importance Index

"Not always their meal is healthy, sometimes it is similar to fast food, fried food or dried food, they don't like the ordinary food" (A mother of adolescent)

"Chips and Beverages are prohibited inside home, but they may buy it outside" (A mother of an adolescent)

"Three of my adolescents are vegetarian, when they were children we faced difficulties with them to convince them what they should eat, but now (the adolescents) becomes more aware on what alternatives to them to eat healthy food with the absence of chicken and meet". (A father of adolescents)

"My adolescent boy is insurgent and moody. He likes fried food very much even at breakfast, mainly fried potato and eggplant. If his mother didn't

The mothers generally forced to do some types of food according to their children' request

According to variation between parents' perception about their adolescents' food intake behaviour, more community based nutritional programs should be conducted aiming to change the attitudes and practices of adolescents and their parents regarding healthy food intake.

A national study was conducted on Palestinian adolescents with regard to food habits and physical activity. It showed noticeable differences between the West Bank and the Gaza Strip, where adolescents of the Gaza Strip eat less fruits, sweets, soft drinks, meat and chicken compared to West Bank. Researchers attributed those differences to the lower socio-economic status in the Gaza Strip where more poverty, reduced accessibility and less availability of several food kinds that are not locally grown or produced. In addition, the study found that girls are more likely to report healthier food choices, with a higher consumption of fruits and vegeTables [48].

The Palestinian micronutrient survey carried out by UNICEF and Palestinian MOH revealed that fruits and vegeTables are consumed

less often by adolescent boys and girls than by the other age groups. It showed also that adolescent boys were higher than girls in consumption of the foods of animal sources that might contribute to the higher prevalence of anemia in female adolescents and youth. Fish consumption amongst people was higher in the Gaza Strip than in the West Bank which is an attribute for geographical location. Adolescents of both sexes consumed crisps and soft drinks rather regularly. In turn, legumes were not consumed very often by any of the groups (Elmadfa, et al. 2013).

Healthy and unhealthy food intake

As shown in Table (8) food intake items were re-categorized into healthy and unhealthy foods then its frequency was presented as a summation into low and high frequent. The results revealed that (56.3%) of adolescents were eating healthy foods with high frequency, especially amongst boys who exceeded girls by a little value being (57.1%) and (55.5%) respectively. In addition, (45.5%) of adolescents were eating unhealthy foods high frequently with girls (46.8%) higher than boys (44.4%). Generally, most of parents in the focus group discussions asserted that their adolescents know what is the healthy food, its content and importance? Yet, they don't pay attention or take it always.

Some mothers said that they try to consider the healthy food and to avoid foods which cause obesity, if some of their children don't like some foods so they compensate with another kind of healthy food.

Most of fathers mentioned that generally, they do their best to convince their children and all family members to eat the healthy food and to avoid un-healthy foods mainly fried foods, but unfortunately this doesn't work all the time. Also, most of them confirmed that their children obey the roles to somehow in the presence of their fathers, but they eat what they want when their fathers are out.

Some of mothers said that they have obese boys at their homes,

"My adolescent boy doesn't agree with our family roles, he skips breakfast, doesn't drink milk or eat eggs, he has his own lifestyle, but what forces me to agree with him that he generally considers healthy foods such as fish and vegetables". (Mother of an adolescent).

"I can't force them to eat everything but I try to convince them, we agreed together on what they want to eat from the healthy food" (Mother of an adolescent).

that this survey has targeted adolescents from 15-18 years old only (Elmadfa1 et al., 2013).

In contrast, global studies showed higher stunting prevalence in the developing countries being expressed as (28.5%). In Ethiopia stunting amongst boys and girls was estimated at (37.7 %) and (21.2 %) respectively, which is higher than in the Gaza Strip according to the present study results [49].

A study in Abeokuta-Nigeria showed that (19.1%) of children in urban schools were stunted, out of them (22.3%) were boys whilst (15.5%) were girls [50]. Anyhow, there is paucity of data on adolescent nutrition in the South-East Africa (SEA) region, where reports from India, Bangladesh, Nepal and Myanmar showed that (32%), (48%), (47%) and (39%) of adolescents respectively are stunted (WHO, 2002).

Regarding body mass index, (22.8%) of adolescents were underweight, and the percentage of boys was higher (27.8%) than girls (16.8%). For further details, (12.7%) of them were overweight, girls were higher than boys (16.2%) and (9.8%) respectively. Within the same context, (3.2%) were obese and the girls showed higher obesity rates than boys as (4%) and (2.4%) respectively, reminding that the ones with normal weight constituted (61.4%). These results are inconsistent with the Palestinian micronutrient survey, which reported that the prevalence of overweight and obesity of girls in the Gaza Strip were (16%) and (4.3%) respectively. Overweight and obesity amongst male adolescents in the Gaza Strip were (11%) and (6.1%) respectively, while (76.2%) of them has normal body weight (Elmadfa et al., 2013).

Some of parents who participated in the focus groups discussion mentioned that they have obese boys, in contrast with females who were underweight.

"Unfortunately I have an obese boy at home, he eats a lot, while his sister is thin"

(Mother of adolescents)

"Girls concern with their general appearance more than boys"

(Mother of adolescents)

However, the results disagree with (Jalambo et al., 2013) findings regarding the prevalence of underweight, and high body mass index being (1.3%) and (19.9%) respectively. It was also higher than the findings of two local studies (Abu-Nada, 2010) and (Abudayya et al., 2011), who revealed prevalence of underweight in the Gaza strip as (7.6%) and (5.4%) in each of the two studies respectively. High body mass index reflecting overweight and obesity amongst both sexes in the Gaza strip was lower than findings of (Abu-Nada, 2010; Abudayya et al., 2011), who pointed out that overweight and obesity among both sexes in the Gaza strip were (29%) and (18.5%) respectively. The study findings agreed with some figures in a descriptive study by (Kanoa et al., 2008) in the Gaza Strip, which was designed among the female university students in order to assess the frequency of females who practiced weight reduction, and to study the weight reduction behaviour and perception [51]. The BMI was distributed as follows: underweight (4.3%), normal (74.9%), overweight (17.3%) and obese (3.4%). Others including; Lubbad, Eljabour, & Salama, (2011) surveyed the body measurements by BMI and dietary intake

accordingly, they try to control their food intake to be healthier.

Anthropometric measurement: As illustrated in Table (9), most of the participants (63%) were normal in terms of age for height, (36.9%) were abnormal, while (7.9%) of them were moderately to severely stunted. These results are closer to the results of a local study (Abu-Nada, 2010), which revealed that overall prevalence of stunting amongst both genders was (7.6%), and lower than (Abudayya et al., 2011) (9.5%). Stunting was also relatively in prevalence amongst males than the females. Severe stunting was less prevalent among boys (1%), while girls showed higher prevalence (9.8%) in moderate stunting than boys (5.4%).

However, these results are inconsistent with the Palestinian micronutrient survey which revealed that stunting and thinness were rare in adolescents (2.9%) in the whole sample. It's worth mention

Food intake	Category	Boys		Girls		Total	
		Freq	%	Freq	%	Freq.	%
Healthy food Intake	Low frequent	88	42.9	77	44.5	165	43.7
	High frequent	117	57.1	96	55.5	213	56.3
Unhealthy Food intake	Low frequent	114	55.6	92	53.2	206	54.5
	High frequent	91	44.4	81	46.8	172	45.5
Grand total		205	100	173	100	378	100

Table 8: Frequency of healthy and unhealthy food intake according to gender

among 140 university students aged 19 to 30 years in the Gaza strip in order to evaluate food consumption and dietary habits associated with weight status in healthy young adult students. Underweight male students were (2.1%), normal (27.9%), overweight (17.1%) and obese ones were (2.9%). Underweight female students were (4.3%), normal (38.61%), overweight (7.1%) and the obese females represented (0%) of all students in the study [52].

The high body mass index in the Gaza Strip was more prevalent amongst females than in males, where the females have a trend to be practicing more sedentary life style. This could be an attribute for cultural trends of the Gaza Strip where girls actually stay at home once becoming 12 years and hence, no more outdoor physical activity is accessible compared to boys. This high body mass was consistently negatively associated with physical activity (Abu-Nada, 2010).

Globally, in South Africa, the girls were significantly heavier, taller, and had a greater BMI than the boys. The prevalence of overweight was (16%) in girls and (2%) in boys, whilst (4%) of females and (2%) of boys were obese [53]. These findings were consistent with our study especially in terms of gender associated obesity.

The decrease in percentage of obesity at the Gaza strip since 2010, could be due to increased number of Gyms clubs and consequently, the percentage of adolescents who practice physical activity, mainly boys. Moreover, the variation in the results between studies may refer to the age of participants, period of study or another variable which is not well known.

Haemoglobin measures: Table (9) shows that, (15.6%) of the study adolescents were anaemic, while (84.4%) of them were non-anaemic, boys (14.1%) were anaemic less than girls (17.3%) (Table 10).

These results were consistent with the Palestinian micronutrient survey which reported that adolescents showed the lowest anaemia prevalence (15.3%) of which (11.8%) was mild and (3.5%) was moderate. Girls were more affected than boys (Elmadfa et al., 2013).

These findings were lower than the local study (Jalambo et al., 2013) that indicated a prevalence of anaemia among students aged 15-18 years as (33.5%) and were also lower than findings of (Abu-Nada, 2010), which revealed an overall prevalence of anaemia (34.5%), with higher prevalence in females (44.0%) than in males (23.3%). Discrepancy in the results is attributed for the use of two different cut off points for haemoglobin level as an identifier of anaemia. In our study, the cut off points for haemoglobin level were 12 gm/dl for girls, and 13 gm/dl for boys aged 15 years and above. While in (Abu-Nada, 2010), the equivalent values were (12.5 gm/dl)

Category		Boy		Girl		Total	
		No.	%	No.	%	No	%
Stunting	Normal	122	60.1	115	66.5	237	63
	Mild stunting	68	33.5	41	23.7	109	29
	Moderate stunting	11	5.4	17	9.8	28	7.4
	Severe stunting	2	1	-	-	2	0.5
Body Mass Index	Under weight	57	27.8	29	16.8	86	22.8
	Normal	123	60	109	63	232	61.4
	Over weight	20	9.8	28	16.2	48	12.7
	Obese	5	2.4	7	4	12	3.2

Table 9: Distribution of study population according to their anthropometric measurement

Category		Boy		Girl		Total	
		No.	%	No.	%	No.	%
Anaemic		29	14.1	30	17.3	59	15.6
Non-Anaemic		176	85.9	143	82.7	319	84.4
Total		205	100.0	173	100.0	378	100

Table 10: Distribution of adolescents according to their Haemoglobin measures

for males and (11.8gm/dl) for females. Similarly, in regional Egyptian study, anaemia was estimated at (51.8%) [54]. Another regional study "Egyptian Demographic and Health Survey" conducted in 2010 showed also that (30%) of adolescents were anaemic.

In an Israeli study on boys' adolescents undergoing strenuously exercises, the ones with haemoglobin level below (13 g/dl) constituted (3.4%) of the study population (Merkel et al., 2005). These results were near to a Turkish study held for adolescents aged 12 to 16 years, where (5.6%) of them were anaemic, including (8.3%) girls and (1.6%) boys [55]. Within the same context, a study conducted in Kuwait found that the level of iron deficiency anaemia amongst children aged (12-14 years) is (9%), and (23%) in adolescents (15-19 years old), the study showed also that prevalence of anaemia and Iron Deficiency was higher in females compared to males [56].

A study in Nepal found that the overall prevalence of iron deficiency anaemia among adolescent population was (65.6%) (Baral & Onta, 2009).

Micro-nutrient measures: In (Figure 5), the total percent of vitamin D deficiency was (8%) whilst the insufficiency was (35.3%), and the percentage of girls in this category (16.7%) and (58.3%) respectively, but, the corresponding boys' percentages were (0%) and (14.1%) respectively. Results of vitamin A were outrageously inconsistent with the updated national Figures of micronutrient's surveys, a matter which rendered the researchers to postponed declaring vitamin A results until fully reviewed and re-assessed.

The Palestinian micronutrients survey findings, showed that vitamin D status of female adolescents (15-18 years) in (72%) of subjects from the Gaza Strip and even deficient in (24%) from the Gaza Strip. On the other hand, vitamin D status of male adolescents show that only about (1%) in the Gaza Strip had a deficient status, while low or sufficient status was observed in (59%) and (39%), respectively, in the Gaza Strip. Regarding gender differences, vitamin D status showed that only (4%) of girls having sufficient status as opposed to about (39.7%) of the boys in the Gaza Strip. Marked deficiency was virtually absent in the boys but affected about (25%) of adolescent girls in the Gaza Strip, respectively (Elmadfa et al., 2013).

However, the study findings disagree with Emirate study which showed (19.7%) of adolescents were vitamin D deficient, and (45.4%) were vitamin D insufficient. The prevalence of vitamin D deficiency varied between boys (10%) and girls (28%). Accordingly, the prevalence of vitamin D deficiency in adolescents in the UAE is veryhigh, particularly in females, compared to their counterparts in other developed countries (Table 11) (Figure 6) [57].

While iron deficiency was among (23.3%) of the study participants, and girls were higher (27.3%) than boys (19.9%). The study results are inconsistent in differences between sex with finding of the (PMS) in which deficient serum iron levels were observed in 30.4% of the boys while 24.3% in the girls in the Gaza Strip (Elmadfa et al., 2013) and consistence with the local study (Abu-Nada, 2010) which indicated that the overall prevalence of serum iron deficiency was (23.6%). Also, the prevalence of serum iron deficiency among females was (31.4%) was relatively double the prevalence among males (15.9%). Moreover, the percentage of zinc deficiency was the

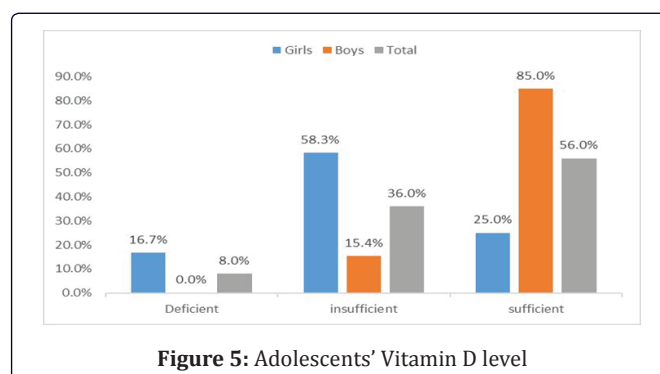


Figure 5: Adolescents' Vitamin D level

VARIABLE	CATEGORY	BOYS		GIRLS		TOTAL	
		NO.	%	NO.	%	NO.	%
IRON	NORMAL	129	80.1	101	72.7	230	76.7
	DEFICIENT	32	19.9	38	27.3	70	23.3
	TOTAL	161	100	139	100	300	100
ZINC	NORMAL	104	64.6	86	48.9	190	63.3
	DEFICIENT	57	35.4	53	38.1	110	36.7
	TOTAL	161	100	139	100	300	100

Table 11: Distribution of adolescents according to their micro-nutrient measures

highest among the micronutrient measurements (36.7%) and girls were slightly higher than boys as (38.1%), (35.4%) respectively, which was around the findings of (Abu-Nada, 2010) where the prevalence of serum zinc deficiency (42.5%), and serum zinc deficiency was found more prevalent among the females (47.7%) more than the males (37.2%). However, these results were less than (PMS) in which zinc was (67.6) in boys and (79.1%) in girls in the Gaza Strip, were deficient. While, only about 21% of the boys and just 9.6% of the girls from the Gaza Strip met the reference levels (Elmadfa et al., 2013).

Physical activity: As illustrated in (Table 12), more than half of adolescents (57.7%) were live sedentary life, girls were (85.5%) higher than boys (34.1%). While (29.9%) of adolescents were active and very active, (49.8%) of boys were active and only (6.4%) of girls were active from total population.

Most of mothers in the focus groups said that their adolescents practice physical activity such as, running, playing football even in the street, walking, hiding horses, riding bicycles, swimming, go to fitness Gym and playing Dabka. Mothers confirmed that boys concern with physical activities more than girls. Some mothers said that they encourage their adolescents to do physical activity. In contrast to what mentioned by mothers, most of fathers in the focus groups said that their adolescents don't practice physical activity except

"My son is obese, he eats a lot, doesn't like to play sport, and convince with his obesity, he doesn't want to lose his weight or to go to Gym" (A mother of adolescent)

"obesity is prohibited at home, and then controlling food intake and doing physical activities is considered one of the main issues". (A mother of adolescent)

"I have only one boy and girls, both of them are adolescents, they ride horse" (A mother of adolescent)

"Boys concern with physical activities more than girls, girls go to gym only to preserve their general appearance or affected by their peers" (A mother of adolescent)

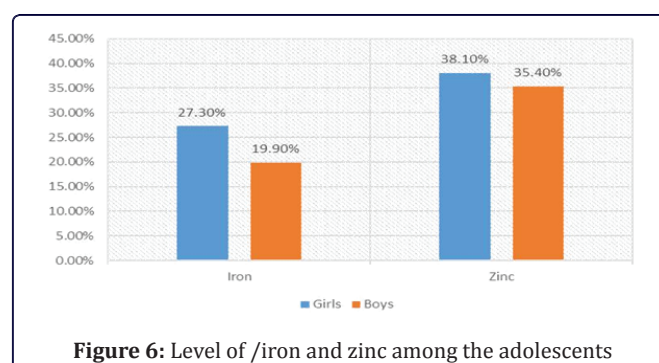
what is available at school. Few of them stated that adolescents go to gymnasium (Gym).

Parents' perceptions about their adolescent's physical activity according to gender are consistent with the results of the questionnaire with adolescents which revealed that boys practice

physical activities more than girls. Parents justified that girls spend most of their time at home, even they practice sport at home or involve in family social life like visiting their relatives or their friends, while boys stay outside with their friend and go to gym affecting by their peers.

These results are around to the Palestinian micronutrient survey which reported that adolescent girls as (52.2%) of them did not exercise regularly outside school hours compared to (21.7%) of the boys. (51.6%) of the adolescent boys exercised 1-3h per day (Elmadfa et al., 2013). Our findings are higher than the findings of a local study (Abu-Nada, 2010; Jalambo et al., 2013) which revealed that more than one third of students practiced sedentary life style. In the same context, physical activity pattern was highly different among the genders. Nearly half of the females (48.7%) practiced sedentary life style and most of them (86.7%) had sedentary and low active life style pattern (Abu-Nada, 2010). On the other hand, (29.9%) of the study adolescents were physically active and very active which was lower than findings of (Abu-Nada, 2010) which reported that (34.1%) of the adolescents were active and very active life. and the males were more active and more than half of them (55.5 %) were physically active and very active.

Globally, (81%) of adolescents aged 11-17 years were insufficiently physically active, that adolescent girls were less active than adolescent boys, with (84%) versus (78%) and not meeting WHO recommendations [58]. Besides, only one in five children in EU countries undertakes moderate-to-vigorous exercise regularly, where results from the 2005-2006 Health Behaviour in School-aged Children (HBSC) survey showed children in Switzerland, Luxembourg and Italy are least likely to exercise regularly, whereas the Slovak Republic and Ireland stand out as strong performers with over (40%)

**Figure 6:** Level of /iron and zinc among the adolescents

Category	Total		Boy		Girl	
	No.	%	No.	%	No.	%
Sedentary	218	57.7	70	34.1	148	85.5
low active	47	12.4	33	16.1	14	8.1
Active	110	29.9	102	49.8	11	6.4
Total	378	100	205	100	173	100

Table 12: Level of Physical activity among adolescents

and (30%) respectively of children aged 11 to 15 exercising for a total of at least 60 minutes per day over the past week of the data collection [59].

Micklesfield et al., (2014) indicate that increasing sedentary behaviour contributes to the development of obesity in adolescent girls, and research on interventions designed to decrease sedentary time in this population are warranted. These could be justified that our modern life style and all the conveniences made us sedentary, that sitting around in front of the TV or the computer, riding in the car for even a short trip and using elevators instead of stairs all contribute to our inactivity. Physical inactivity is as dangerous to our health as smoking (Abu-Nada, 2010).

As well, Al-Sabbah et al., (2010) study results revealed that girls are less likely to be physically active. It is to some extent not acceptable by neither their families nor their social environment, denoting a discouraging cultural factor.

These findings are true because boys practice physical activity out of homes freely, but girls are not allowed by their family. Girls in general, do their physical activity inside their homes and mostly like domestic cleaning and few minutes of physical exercise. In the same context, the present study showed that more than two third of the girls were followed sedentary life style. This can be explained that the girls stay longer time in homes than boys and spend the time in watching TV, using computer and reading, meanwhile boys play football, ride bicycle, and practice running exercise, which are heavy physical activity.

In general, physical activity is not common among Palestinians in the GS. This may due to lack of public area for practicing physical activity, unstable political situation affects negatively on the mode of the community and low awareness of the community toward the importance and the benefits of physical activity for their health status (Abu-Nada, 2010).

Psychological health dimensions: The following Tables detailed the findings of the subjective of psychological health domains for school children, aged 12-18 years. It illustrated the results of their perceptions of their psychological health and well-being across 4 dimensions (Depressive mood; Anxiety; Behavioural emotional control; and Psychological well-being).

Depressive mood Domain: This dimension explores the perceived depression status of adolescents in term of their feeling. The participants were asked 30 questions illustrated in the Table below, they were expressed their negative and positive feelings and the signs of somatic disease they have been felt.

Half (50.3%) of participant 'always' and 'very often' or quiet 'often' felt so bad that they didn't want to do anything. (62.7%) of participants reported that they 'seldom' or 'never' didn't get rest or sleep in the last two weeks, (18.8%) 'always' and 'very often' or quiet 'often' felt as failure, about (38.3%) 'always' and 'very often' or quiet 'often' felt hard to enjoy any things (Table 13). It's worth to mention that feeling guilty, disappointed of self, feeling punished, feeling embarrassed of self because of weakness and mistakes got the lowest score. In the same context (6.6%) of adolescent have 'always' and 'very often' or quiet 'often' been thought of suicide. It's worth to mention that, in a published article they reported that (90%) of suicide amongst teenagers had a diagnosable mental illness, depression being the most common [60]. As well (48.1%) of adolescent are easily cry. Approximately (58%) of participant 'reported always' and 'very often' or quiet 'often' feeling annoyed and irritant. Around (31.5%) of them reported 'always' and 'very often' or quiet 'often' losing interest with people, while (12.8%) of them 'always' and 'very often' or quiet 'often' losing interest with their parents and family members. Around half (53.4%) of adolescent 'always' and 'very often' or quiet 'often' don't make decisions which corresponding with UNICEF report in terms of participation in decision making, the participation of young people in decisions that affect their lives inside their families, in educational institutions, at work and in the community, at large is limited (UNICEF, 2003). About (46.1%) of participants 'always' 'very often' or 'quite often' force them self to do activity, (41.4%) of adolescent 'always' and 'very often' or quiet 'often' don't sleep well and feel tired. Around (36%) of them have no appetite and worries

about their health, (38.1%) 'always' or 'very often' had insomnia and sleep disorder and (26.2%) of adolescents had nightmares. About (51.8%) of participant had 'always' and 'very often' mood swings. Also, (25.9%) of them reported increasing in their weight while (13.5%) reported decrease in weight and (23.8%) reported lack of appetite. According to report published by UNICEF the psychosocial situation among adolescents worsened during the past five years of conflict. Children and adolescents are suffering from emotional problems such as headaches, sleeping disorders, violent acts, loss of appetite (UNICEF, 2003).

The result of this domain reflects high percent of adolescent feel depressed, lonely, and not sharing in decision making. Undoubtedly,

As Professor Vostanis said in study about Gazan adolescents: "The toll on the mental health of these young people tends to be exacerbated by poverty, which is endemic in Gaza. It's a double whammy for many of them. As well as the conflict, itself, they are also affected by how their parents respond, by the provision of basic needs and if there's a sense of helplessness." (Vostanis, 2014).

many of these behaviours are carried out periodically by perfectly normal teenagers, and must be assessed in context with their normal behaviour (Tyrrell and Elliott, 2016).

In a recent study by the Queen Elizabeth Medical Centre in Western Australia, out of 400 children aged 9 - 12 years, only 16 ones were found to be clinically depressed, and 112 ones were assessed and classified as being vulnerable to future depression. The depressed children believed that happiness is achieved through the acquisition of fame, money and beauty. Happier children tended to believe that feeling good comes from healthy attitudes and pursuing worthwhile goals.

Anxiety domain: This domain explores the level of anxiety for the adolescents, the questions look at how much adolescent's experience negative feelings about anxiety such as worried, nervousness, hard to enjoy life, annoyed and so on. They also reflected the adolescent's somatic complaint. The respondents were asked 12 questions related to anxiety feelings as reported in the past 2-4 weeks, prior to filling the questionnaire.

As illustrated in the Table (14) adolescents felt worry, anxious and tense in the past 2-4 weeks, (27.5%) of them were 'always' or 'very often' or 'quiet often' did. Around half (56.1%) of adolescent 'always' or 'very often' or 'quiet often' been very nervous persons. Around (27.8%) of them were quiet often hard to enjoy. About (58%) 'always' or 'very often' or 'quiet often' felt annoyed and irritated, and (24.1%) feel worry about their appearance. The adolescents who 'always' or 'very often' or 'quiet often' worry about their health were (37.3%), while (24.1%) are felt worry about their appearance in front of their friends. Adolescent reported somatic symptoms like breathing difficulties and rapid heartbeat neck and shoulder pain nervous and anxious fear and phobia. The highest percent were to neck and shoulder as reported (49.2%) of them 'always' and 'very often' had pain while (40.5%) for nervousness and anxiety, (41.3%) for fear and phobia.

Study investigated types of traumatic events experienced by Palestinian adolescents exposed to war in Gaza in relation to post-traumatic stress disorder (PTSD), anxiety and coping strategies and has found that a substantial number of adolescents in these situations develop a range of long-lasting emotional and behavior problems. Of the adolescents studied, the majority witnessed mutilated bodies on TV, were exposed to heavy artillery shelling, saw evidence of shelling and heard sonic sounds from jet fighters. Thus, many adolescents developed anxiety disorders, with females reporting a greater number of PTSD symptoms than males (Table 14) [61].

Another local study showed that adolescents commonly reported the following anxiety symptoms after the war 2014: I have to do some things over and over again (like washing my hands, cleaning or

Answer	Always		Very often		Quite often		Seldom		Never		M	RII
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%		
Have you been in a good mood ?	74	19.6	60	15.9	178	47.1	33	8.8	33	8.7	3.29	66%
Have you had fun ?	85	22.5	83	22	148	39.2	27	7.1	35	9.3	3.41	68%
Have you ever felt sad ?	25	6.6	33	8.7	125	33.1	82	21.7	113	29.9	3.6	72%
Have you ever felt lonely ?	21	5.6	14	3.7	42	11.1	52	13.8	249	65.9	4.31	86%
Have you ever felt so bad that you didn't want to do anything?	43	11.4	32	8.5	115	30.4	55	14.6	133	35.2	3.54	71%
During the past 30 days, have you felt you did not get enough rest or sleep	60	15.9	44	11.6	37	9.8	98	25.9	139	36.8	3.56	71%
I'm a failure	8	2.1	8	2.1	55	14.6	55	14.6	252	66.7	4.42	88%
It is hard for me to enjoy things	16	4.2	24	6.3	105	27.8	57	15.1	176	46.6	3.93	79%
I feel guilty	12	3.2	26	6.9	99	26.2	74	19.6	167	44.2	3.95	79%
I feel I am punished	11	2.9	9	2.4	58	15.3	64	16.9	236	62.4	4.34	87%
I am disappointed myself	10	2.6	9	2.4	53	14	53	14	253	66.9	4.4	88%
I feel embarrassed of myself for my weaknesses mistakes	21	5.6	15	4	101	26.7	69	18.3	172	45.5	3.94	79%
I have thoughts of killing myself	8	2.1	5	1.3	12	3.2	19	5	334	88.4	4.76	95%
I cry	38	10.1	40	10.6	106	28	81	21.4	113	29.9	3.51	70%
I feel annoyed and irritated	31	8.2	38	10.1	150	39.7	74	19.6	85	22.5	3.38	68%
I lose interest with people	9	2.4	14	3.7	96	25.4	65	17.2	194	51.3	4.11	82%
I lose interest with parents or family members	7	1.9	7	1.9	34	9	42	11.1	288	76.2	4.58	92%
I don't make decisions	31	8.2	20	5.3	151	39.9	67	17.7	109	28.8	3.54	71%
I feel worry about my appearance	21	5.6	13	3.4	57	15.1	44	11.6	243	64.3	4.26	85%
I have to force myself to do anything	53	14	38	10.1	83	22	41	10.8	163	43.1	3.59	72%
I don't sleep well	27	7.1	24	6.3	106	28	72	19	149	39.4	3.77	75%
I am tired and listless	26	6.9	27	7.1	105	27.8	72	19	148	39.2	3.76	75%
I have no appetite	19	5	16	4.2	104	27.5	62	16.4	177	46.8	3.96	79%
I am worried about my health	31	8.2	26	6.9	84	22.2	54	14.3	183	48.4	3.88	78%
Sleep disorder/ insomnia	50	13.2	94	24.9	0	0	42	11.1	192	50.8	3.61	72%
Nightmares	34	9	65	17.2	0	0	54	14.3	225	59.5	3.98	80%
Mood swings	67	17.7	129	34.1	0	0	45	11.9	137	36.2	3.15	63%
Weight gain	28	7.4	70	18.5	0	0	56	14.8	224	59.3	4	80%
Weight loss	7	1.9	43	11.4	0	0	37	9.8	291	77	4.49	90%
Lack of appetite	16	4.2	74	19.6	0	0	47	12.4	241	63.8	4.12	82%
				Total							3.9	78%

Table 13: Depressive mood symptoms measures

*Hint: M=Mean of answers, RII=Relative Importance Index

Answer	Always		Very often		Quite often		Seldom		Never		M	RII
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%		
During the past 30 days, have you felt worried, tension, or anxious?	40	10.6	40	10.6	24	6.3	103	27.2	171	45.2	3.86	77%
How much of the time have you ever been a very nervous person?	133	35.2	28	7.4	51	13.5	116	30.7	50	13.2	2.79	56%
It is hard for me to enjoy things	16	4.2	24	6.3	105	27.8	57	15.1	176	46.6	3.93	79%
I feel annoyed and irritated	31	8.2	38	10.1	150	39.7	74	19.6	85	22.5	3.38	68%
I feel worry about my appearance	21	5.6	13	3.4	57	15.1	44	11.6	243	64.3	4.26	85%
I am worried about my health.	31	8.2	26	6.9	84	22.2	54	14.3	183	48.4	3.88	78%
Have you feel worry about your look in front of your friends?	24	6.3	13	3.4	46	12.2	28	7.4	267	70.6	4.33	87%
Breathing difficulties	29	7.7	55	14.6	0	0	42	11.1	252	66.7	4.15	83%
Rapid heart beat	19	5	67	17.7	0	0	63	16.7	229	60.6	4.1	82%
neck and shoulder pain	49	13	137	36.2	0	0	54	14.3	138	36.5	3.25	65%
nervousness / anxiety	54	14.3	99	26.2	0	0	64	16.9	161	42.6	3.47	69%
fear / phobia	46	12.2	110	29.1	0	0	53	14	169	44.7	3.5	70%
Total											3.74	75%

Table 14: Anxiety symptoms measures

*Hint: M=Mean of answers, RII=Relative Importance Index

putting things) (65.9%) and when the participant had a problem, his/her heart beats really fast (62%), she/he felt scared when having to take a test (50.2%) [61].

Behavioural emotional control domain: This domain reveals the ability of adolescent in controlling their behaviour and emotions, it's also reflects the burden student feel in different sides of life such as study, exams, problem with peers and family and isolation. It consists of 16 questions taken into account the perception of the adolescent's feelings.

NB: The percentage above were calculated of three categories 'always' or 'very often' or 'quiet often' Results in (Table 15) demonstrated that in the last month (14.8%) of adolescents 'seldom' and 'never' control their stress and (19.3%) were 'seldom' or 'never' had a firm control over their behaviour, around (20.1%) 'seldom' or 'never' controlled their feeling and emotions (Table 15). More than half of adolescents (65.9%) 'always' or 'very often' or 'quiet often' felt burden of study, while (73.2%) 'always' or 'very often' or 'quiet often' felt burden from exams, (53.9%) 'always' or 'very often' or 'quiet often' felt burden from assignment and presentation, (49.7%) 'always' or 'very often' or 'quiet often' complains from lack of time for studies. Only (20.3%) 'always' or 'very often' or 'quiet often' reported problems with parents, while (15.7%) 'always' or 'very often' or 'quiet often' report problems with their fellow students. Around (17.7%) complain of their housing, only (7.7%) had a problem with their teachers. (17.2%) had financial problem. (6.9%) were isolation in school while (5.2%) are isolated in general. (3.7%) were never got well at school and the adolescent who reported speech impediment sometimes was (16.5%).

Generally, most of mothers who participated in the focus group discussions said that yes, their adolescents have sometimes bad behaviour such as aggressive, anxious, some of the mothers contacted with psychological specialist to consult them how to deal with their adolescents in this critical age. While all of fathers confirmed that there is no psychological problem with their adolescents except minor stress due to the general surrounding environment and last three wars which effect on the whole people. This may reflect that fathers don't have enough or deep information about their adolescent daily life or psychological status like mothers who are generally close to their family member more than fathers who are outside homes or

at work. Also, adolescent could feel hesitate to express their feeling in front of their parents mainly fathers.

Most of the mothers said that there is individual differences and variation between adolescents according to gender. Some mothers reported that girls generally better than boys in showing less aggressive behaviours; they are shy and calm, but from the

"At home every one of my adolescents has his own personality, habits and behaviour, also girls differ from boys" (A mother of adolescent)

"Definitely they are changed after war, they became more aggressive and afraid from any things mainly girls" (A mother of adolescent)

"Mother is the main person who has effect on her children and more aware about their daily life behaviour" (A father of adolescent)

other side girls more sensitive than boys and affected with the surrounding environment. Accordingly, parents may need to be involved in awareness sessions to help them on how to deal with their adolescents.

"My boy said that there is bullying phenomenon among students inside his school, but he is not part of this, despite he is enjoying following them and see their violence" (A mother of adolescent)

"Regrettably, my boy is involving in bullying and he is leading such group, I'm trying to change his behaviour positively but this still needs more efforts". (A mother of adolescent)

"My adolescent boy was targeted negatively by his classmates who hit him, this affected on him at first but he got rid quickly after this accident finished and the boys were punished by the head of school. (A mother of adolescent)

Answer	Always		Very often		Quite often		Seldom		Never		M	RII
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%		
During the past month have you been in firm control of your stress?	112	29.6	63	16.7	147	38.9	25	6.6	31	8.2	2.47	49%
During the past month have you been in firm control of your thoughts?	126	33.3	58	15.3	121	32	36	9.5	37	9.8	2.47	49%
During the past month have you been in firm control your emotions and feelings?	132	34.9	58	15.3	112	29.6	28	7.4	48	12.7	2.48	50%
Studies in general	68	18	43	11.4	138	36.5	42	11.1	87	23	3.10	62%
Exams	129	34.1	45	11.9	103	27.2	35	9.3	66	17.5	2.64	53%
Assignments presentations	65	17.2	33	8.7	106	28	43	11.4	131	34.7	3.38	68%
lack of time for studies	47	12.4	37	9.8	104	27.5	57	15.1	133	35.2	3.51	70%
Problems with parents	21	5.6	16	4.2	39	10.3	59	15.6	243	64.3	4.29	86%
Problems with fellow students	7	1.9	7	1.9	45	11.9	73	19.3	246	65.1	4.44	89%
Housing	22	5.8	18	4.8	27	7.1	15	4	296	78.3	4.45	89%
Problems with teachers	4	1.1	3	0.8	22	5.8	45	11.9	304	80.4	4.70	94%
Financial situation	20	5.3	12	3.2	34	9	31	8.2	281	74.3	4.43	89%
Isolation at the school	3	0.8	2	0.5	22	5.8	8	2.1	343	90.7	4.81	96%
Isolation in general	3	0.8	3	0.8	19	5	13	3.4	340	89.9	4.81	96%
Speech impediment	10	2.6	23	6.1	29	7.7	314	83.1	2	0.5	3.73	75%
Have you got on well at school?	178	47.1	82	21.7	95	25.1	10	2.6	13	3.4	1.94	39%
Total											3.60	72%

Table 15: Behavioural emotional control scale

*Hint: M=Mean of answers, RII=Relative Importance Index

Regarding Bullying phenomena which reflects violence and aggressive behaviour among the adolescents mainly boys. Few mothers asserted that there is bullying at school which needs more concern from decision makers.

This reflects that violence presence among boys even in individual manner or small scale but needs more attention to control this phenomenon and eradicate it. In the same context, most of the mothers asserted that school environment has effect on their adolescent's feeling and behaviour weather positively or negatively. While, most of the fathers asserted that home environment affected on their adolescent's feeling and behaviour weather positively or negatively, that's why they take care of the relationship between all family members. Moreover, schools health teachers asserted that peers affect each other whether positively or negatively. From the above output, there is lack in the parents' ability in dealing with their adolescents, accordingly more attention should be paid in conducting awareness session and follow up for parents by different organizations to enhance their role in psychological side with their adolescents.

Psychological wellbeing domain: This dimension covers the positive feelings of adolescents that reflect their happiness, relaxation, feeling peacefully, optimistic and interested in life. The respondent was asked 21 questions refer to their satisfaction in life.

(Table 16) illustrated that about (87.3%) of adolescent stated that they were 'always' very often' and 'quite often' a happy person in the last month, more than half of them (59%) were relaxed and free of tension through the last month. About (85.5%) of adolescent were 'always' or 'very often' or 'quiet often' optimistic towered their future, which near to the UNICEF report in which (91%) say they are

optimistic about the future (UNICEF, 2003). (20.6%) have 'seldom' or 'never' felt calm and (63.3%) of them have 'very often' or 'always' been able to do things that they want to do in their free time. As well (15.7%) have 'seldom' or 'never' the ability to handle their problem while (25.4%) have 'seldom' or 'never' felt that thing was going in their way. Also, (57.1%) of the adolescent have 'very often' or 'always' been felt they are useful, only (8.2%) have 'seldom' or 'never' been feeling interested in other people, (25.7%) of adolescent have 'seldom' or 'never' energy to spare, and (57.2%) of adolescents have 'very often' or 'always' been able to think clearly, (59.6%) of them have 'very often' or 'always' been feeling good about their self. About half (59.5%) of them have been felt close to people. As well (77.8%) of participants have 'very often' or 'always' been felt confidence. (13.2%) of adolescent have 'seldom' or 'never' been build their own idea about problems, (75.4%) of them have 'very often' or 'always' felt loved by other, (60%) of participants have 'very often' or 'always' been felt interested with new ideas, (55.5%) have 'very often' or 'always' been felt cheerful. (19%) have 'seldom' or 'never' been able to pay attention at school and (5.5%) have 'very often' or 'always' a problem with their teachers. Noting that hope and optimism are the two core components of beliefs in the future, it is necessary to help adolescents to internalize both hope and optimism by facilitating them to manipulate their goal-directed thoughts and motivation and by providing a supportive environment including their family, school, peers and the community [62].

Total score of psychological domain: As shown in (Table 17), (47.1%) of adolescent perceived depressed mood where girls were higher than boys. Around (46%) of adolescent were anxious and girls were higher than boys. Girls were more controlled (45.1%) their behaviour and emotion than boys. About (45.5%) of adolescence

Answer	Always		Very often		Quite often		Seldom		Never		M	RII
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%		
During the last month, how much of the time were you a happy person?	209	55.3	59	15.6	62	16.4	39	10.3	9	2.4	1.89	38%
How much of the time, during the past month, did you feel relaxed and free of tension?	179	47.4	44	11.6	62	16.4	72	19.0	21	5.6	2.24	45%
How much of the time, during the past month, have you felt calm and peaceful?	206	54.5	33	8.7	61	16.1	62	16.4	16	4.2	3.93	79%
Have you been able to do things that you want to do in your free time?	170	45	69	18.3	103	27.2	22	5.8	14	3.7	3.95	79%
How often have you felt confident about your ability to handle your personal problems?	130	34.4	189	50	0	0	38	10.1	21	5.6	3.98	80%
How often have you felt that things were going your way?	90	23.8	192	50.8	0	0	66	17.5	30	7.9	3.65	73%
How often have you felt difficulties were piling up so high that you could not overcome them?	59	15.6	147	38.9	0	0	93	24.6	79	20.9	2.96	59%
I've been feeling optimistic about future	125	33.1	85	22.5	113	29.9	28	7.4	27	7.1	3.67	73%
I've been feeling useful	126	33.3	90	23.8	124	32.8	18	4.8	20	5.3	3.75	75%
I've been feeling interested in other people	163	43.1	76	20.1	108	28.6	16	4.2	15	4.0	3.94	79%
I've had energy to spare	87	23	63	16.7	131	34.7	51	13.5	46	12.2	3.25	65%
I've been thinking clearly/obviously*	139	36.8	77	20.4	120	31.7	23	6.1	19	5.0	3.78	76%
I've been feeling good about myself	139	36.8	86	22.8	117	31	18	4.8	18	4.8	3.82	76%
I've been feeling close to other people	158	41.8	67	17.7	109	28.8	29	7.7	15	4.0	3.86	77%
I've been feeling confident	208	55	86	22.8	58	15.3	15	4.0	11	2.9	4.23	85%
I've been able to make up my own mind about things	137	36.2	77	20.4	114	30.2	26	6.9	24	6.3	3.73	75%
I've been feeling loved**	190	50.3	95	25.1	67	17.7	12	3.2	14	3.7	4.15	83%
I've been interested with new things	157	41.5	70	18.5	89	23.5	39	10.3	23	6.1	3.79	76%
I've been feeling cheerful	121	32	89	23.5	126	33.3	27	7.1	15	4.0	3.72	74%
I've been able to pay attention at school	101	26.7	77	20.4	128	33.9	30	7.9	42	11.1	3.44	69%
I've got along well with my teacher	231	61.1	62	16.4	64	16.9	13	3.4	8	2.1	4.31	86%
Total											3.62	72%

Table 16: distribution of study population by Psychological wellbeing domain

*Hint: M=Mean of answers, RII=Relative Importance Index

reflected poor psychology while (54.5%) of them reflected good psychology. According to gender boys showed better psychological status than girls. These results are in consistent with findings of (Thabet et al., 2014) which emphasized that, the mean total anxiety for adolescent in Gaza after war was (41.1%). Girls reported more anxiety problems than boys. Military trauma in middle childhood and stressful life-events in early adolescence were risk factors for PTSD and depressive symptoms and decreased satisfaction with the quality of life during adolescence.

Also, there was a higher prevalence of depressive-like symptoms among girls compared with boys and in adolescents living in Palestinian refugee camps compared with those living in cities, towns and villages.

A Norway study found that, the relationships between demographic variables and life satisfaction was weak, and research has shown that those variables contribute only modestly to the prediction of adolescent life satisfaction. From the other hand, differences have generally shown that boys report higher scores than

girls [63].

Quality of Life Domains: The following Tables detail the findings of the subjective health-related quality of life of adolescents, aged 12-19 years. The results of their perceptions of their health and well-being are presented across 9 dimensions of health.

Physical well-being: This dimension explores the level of physical activity of the adolescent in terms of their energy and fitness. The level of physical activity is examined with reference to their ability to get around and walk wide steps, and to play or do physically demanding activities (e.g. carry and left goods, climb stairs, dressing or bathing yourself) since any impairment will affect physical activity. The dimension the extent to which a child or adolescent feels unwell and complains of poor health is examined.

Participants were asked 7 questions relating to their physical well-being. Overall, (96.5%) of all respondents felt that their health was 'good', 'very good' or 'excellent'. The result was close to Ireland on perceived general health, (95%) of all respondents felt their health was 'good', 'very good' or 'excellent' (Keenaghan and Kilroe, 2008)

Category		Total		Boy		Girl	
		No.	%	No.	%	No.	%
Perceived Depression Domain	Depressed	178	47.1	86	42	92	53.2
	Non-Depressed	200	52.9	119	58	81	46.8
Perceived Anxiety domain	Anxious	174	46	82	40	92	53.2
	Not Anxious	204	54	123	60	81	46.8
Perceived Behavioural emotional control domain	Un Controlled	215	56.9	120	58.5	95	54.9
	Control	163	43.1	85	41.5	78	45.1
Perceived Psychological wellbeing domain	Poor	191	50.5	104	50.7	87	50.3
	Good	187	49.5	101	49.3	86	49.7
Perceived total Psychological status	Poor	172	45.5	86	42	86	49.7
	Good	206	54.5	119	58	87	50.3
Total		378	100	205	100	173	100

Table 17: Psychological category according to gender

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
In general, how would you say your health is?	10	2.6	3	0.8	92	24.3	120	31.7	153	40.5
Have you felt fit and well?	76	20.1	21	5.6	0	0	0	0	281	74.3
Have you been physically active to walk wide steps?	240	63.5	61	16.1	51	13.5	21	5.6	5	1.3
Have you been physical active to carry and left goods?	223	59	63	16.7	61	16.1	20	5.3	11	2.9
Have you been physically active to climb stairs?	202	53.4	68	18	66	17.5	34	9	8	2.1
Have you been physically active to dressing or bathing yourself?	3	0.8	3	0.8	0	0	9	2.4	363	96
Have you felt full of energy?	87	23	63	16.7	131	34.7	51	13.5	46	12.2
(1-100)								82.7		

Table 18: Physical well-being measuring scale

*Responses for this questions are 'poor', 'fair', 'good', 'very good', 'excellent'

This similarity between adolescents from developing country such as Palestinian adolescents in compare to Irish adolescents in developed countries could be justified due to expansion using internet by adolescents in addictive manner.

Results in (Table18) show that (74.3%) of respondents stated that always they have felt 'fit and well within the last 2 weeks prior to completing the questionnaire. In response to the question about their ability to get around and walk or do physically demanding activities, (79.6%) reported that they have been 'very often' or 'always' physically active. Also, (75.7%) of respondents stated that they have been 'very often' or 'always' able to carry and left goods, (71.4%) indicated that they have 'very often' or 'always' physically active to climb stairs and overall of them asserted that they have been physically active to dressing or bathing themselves. A further (39.7%) only stated that they have 'very often' or 'always' felt full of energy and (34.7%) of them stated that the have quite often felt full of energy.

Referring to a comparative study between Portuguese and Spanish adolescents quality of life, the researchers reported that Portuguese girls only scored significantly lower than boys in the Physical Wellbeing dimension. Moreover, a significant difference between boys and girls on the quality of life dimensions in Spanish adolescents was found when compared to Portuguese. Also, Spanish girls scored significantly lower than Spanish boys in the Physical Wellbeing dimension [64].

Psychological well-being: This dimension examines the

psychological well-being of the adolescent, including positive emotions and satisfaction with life. It specifically reveals the positive perceptions and emotions experienced by the individual. The questions look at how much the adolescents experience positive feelings, such as happiness, joy, fun and cheerfulness. They also reflect the person's view of their satisfaction with life so far. The presence of mental disorders was expected to manifest itself through lower scores in all KIDSCREEN dimensions but particularly in the Psychological Well-being, Moods and Emotions and Self-Perception dimensions [65].

Results depicted in Table (19) respondents were asked 6 questions relating to their psychological well-being as experienced in the last 2 weeks prior to completing the questionnaire. The results across this dimension indicate that (57.1%) of respondents felt that their life has been 'very often' or 'always' enjoyable. Overall, (97.6%) of respondents perceived that they have felt 'very often' or 'always' pleased, and (83.7%) reported that they have 'very often' or 'always' had fun. At the other extreme, only (17.4%) mentioned that they have 'never' or 'seldom' been in a good mood, (11.1%) stated that they have 'never' or 'seldom' felt cheerful, and only (9.6%) revealed that they have 'never' or 'seldom' felt satisfied with their life.

On Ireland study (75%) of all respondents felt that their life has been 'very' or 'extremely' enjoyable. (86%) of all respondents perceived that they have felt 'very' or 'extremely' pleased that they are alive, and (78%) reported that they have 'very often' or 'always' had fun. At the other extreme, 8% stated that they have 'never' or 'seldom' felt cheerful and 8% revealed that they have 'not at all' or

'slightly' felt satisfied with their life, which is corresponding to our results in the same dimension (Keenaghan & Kilroe, 2008)

Moods and emotions: This dimension covers how much the adolescent experiences depressive moods and emotions, and stressful feelings. It specifically reveals feelings such as loneliness, sadness, sufficiency/insufficiency and resignation. Furthermore, this dimension takes into account how distressing these feelings are perceived to be.

Respondents were asked 7 questions relating to their mood as experienced in the last 2 weeks prior to completing the questionnaire.

Table (20) shows that (74.6%) of respondents reported that they have 'never' or 'seldom' felt everything in their life goes wrong. About (75.4%) of respondents stated that they have 'never' or 'seldom' felt under pressure. At the other extreme, (63.8%) of respondents perceived that they have 'very often' or 'always' felt that they do everything badly. Also, (51.6%) of respondents states that they have 'very often' or 'always' felt sad. About (49.8%) reported that they have 'very often' or 'always' felt so bad that they didn't want to do anything. In the same context, (79.7%) revealed that they have 'very often' or 'always' felt lonely, and (58.2%) indicated that they have 'very often' or 'always' felt fed up.

To somehow our result is near to the result of Ireland study which shows that (78%) of all respondents reported that they have 'never' or 'seldom' felt that they do everything badly. (76%) of all respondents stated that they have 'never' or 'seldom' felt sad and (84%) perceived that they have 'never' or 'seldom' felt so bad that they didn't want to do anything. At the other extreme, (17%) revealed that they have 'very often' or 'always' felt under pressure, (11%) indicated that they have 'very often' or 'always' felt fed up, and (7%) reported that they have 'very often' or 'always' felt that they do everything badly (Keenaghan & Kilroe, 2008).

Self-perception: This dimension explores the adolescent's self-perception. It includes whether the appearance of the body is viewed positively or negatively. Body image is explored by questions concerning satisfaction with looks. The dimension examines how satisfied adolescents feel about themselves, as well as their appearance. Results are meant to reflect the value individuals assign to themselves and the perception of how positively others value them.

Respondents were asked to respond to 5 questions relating to their self-perception as experienced in the 2 week prior to completing the questionnaire. (Table 21) indicates that (70.9%) of respondents reported that they have 'very often' or 'always' been happy with the

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have your life being enjoyable?	20	5.3	18	4.8	124	32.8	90	23.8	126	33.3
Have you felt pleased?	209	55.3	59	15.6	62	16.4	39	10.3	9	2.4
Have you felt satisfied with your life?	18	4.8	18	4.8	117	31.0	86	22.8	139	36.8
Have you been in a good mood?	33	8.7	33	8.7	178	47.1	60	15.9	74	19.6
Have you felt cheerful?	15	4.0	27	7.1	126	33.3	89	23.5	121	32.0
Have you had fun?	35	9.3	27	7.1	148	39.2	83	22.0	85	22.5
(1-100)									66.3	

Table 19: Psychological well-being measuring scale

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have you felt that you do ever thing badly?	172	45.5	69	18.3	101	26.7	15	4	21	5.6
Have you felt sad?	113	29.9	82	21.7	125	33.1	33	8.7	25	6.6
Have you felt so bad that you didn't to do anything?	133	35.2	55	14.6	115	30.4	32	8.5	43	11.4
Have you felt that everything in your life goes wrong?	90	23.8	192	50.8	66	17.5	29	7.7	1	0.3
Have you felt fed up?	148	39.2	72	19	105	27.8	27	7.1	26	6.9
Have you felt lonely?	249	65.9	52	13.8	42	11.1	14	3.7	21	5.6
Have you felt under pressure?	21	5.6	72	19	62	16.4	44	11.6	179	47.4
(1_100)									67.1	

Table 20: moods and emotion scale

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have you been happy with the way you are?	209	55.3	59	15.6	62	16.4	39	10.3	9	2.4
Have you been happy with your general appearance?	20	5.3	18	4.8	0	0	122	32.3	218	57.7
Have you been worry about the way you look?	243	64.3	44	11.6	57	15.1	13	3.4	21	5.6
Would you like to change something about your body?	325	62.2	0	0	0	0	0	0	143	37.8
Have you felt jealous of the way other colleagues look?	267	70.6	28	7.4	46	12.2	13	3.4	24	6.3
(1_100)									82	

Table 21: Self -perception measures

way they are. (90%) of respondents stated that they have ‘very often’ or ‘always’ been happy with general appearance. About (75.6%) perceived that they have ‘never’ or ‘seldom’ been worried about the way they look, while (37.8%) revealed that they would ‘always’ like to change something about their body. As well (78%) indicated that they ‘never’ or ‘seldom’ felt jealous of the way other colleagues look.

These results are near to the Ireland results in this domain which indicates that (65%) of all respondents reported that they have ‘very often’ or ‘always’ been happy with the way they are. (73%) of all respondents stated that they have ‘very often’ or ‘always’ been happy with their clothes. (57%) perceived that they have ‘never’ or ‘seldom’ been worried about the way they look, while (24%) revealed that they ‘very often’ or ‘always’ have been worried. (61%) indicated that they would ‘never’ or ‘seldom’ like to change something about their body, while (27%) would ‘very often’ or ‘always’ like to change something about their body (Keenaghan & Kilroe, 2008).

Autonomy: This dimension looks at the opportunity given to adolescent to create his or her own social and leisure time. It examines the person’s level of autonomy, seen as an important developmental issue for creating an individual identity. This refers to the adolescent’s freedom of choice, self-sufficiency and independence. In particular, the extent to which they feel able to shape their own lives, as well as being able to make decisions about day-to-day activities, will be considered.

Respondents were asked 2 questions relating to their social and leisure time. (Table 22) indicates that (63.3%) of all respondents reported that they have ‘very often’ or ‘always’ been able to do the things that they want to do in their free time and (77%) perceived that they have ‘very often’ or ‘always’ had enough time to meet friends.

In this domain, the Ireland study indicates that (59%) of all respondents reported that they have ‘very often’ or ‘always’ had enough time for themselves. (65%) perceived that they have ‘very often’ or ‘always’ had enough time to meet friends. (18%) indicated that they have ‘never’ or ‘seldom’ been able to do the things that they want to do in their free time (Keenaghan & Kilroe, 2008).

Parent relations and home life: This dimension examines the relationship of the adolescent with their parents. It explores the quality of the interaction between the adolescent and the parents. Particular importance is attached to whether the adolescent feels loved and supported by the family, and whether the child/adolescent feels fairly treated.

Respondents were asked 3 questions relating to parent relations. (Table 23) illustrated that (59.3%) of respondents reported that their parents have ‘very often’ or ‘always’ had enough time for them

and (82.5%) of them perceived that their parents have ‘very often’ or ‘always’ treated them fairly. Also (75.6%) revealed that they have ‘very often’ or ‘always’ been able to talk to their parents when they wanted to. As noticed from the result of this domain, there is a good relationship between adolescents and their parents, the same as Ireland study which indicates that (64%) of all respondents reported that their parents have ‘very’ or ‘extremely’ understood them. (85%) stated that they have felt ‘very’ or ‘extremely’ loved by their parents and (75%) perceived that they have ‘very often’ or ‘always’ been happy at home. (72%) indicated that their parents have ‘very often’ or ‘always’ had enough time for them and treated them fairly (75%). At the other end of the scale, (12%) revealed that they have ‘never’ or ‘seldom’ been able to talk to their parents when they wanted to, while (14%) perceived that their parents have ‘not at all’ or ‘slightly’ understood them (Keenaghan & Kilroe, 2008).

Social support and peers: This dimension examines the nature of the adolescent’s relationships with other adolescents and considers the social relations with friends and peers. The dimension explores the quality of the interaction between the adolescent and peers, as well as their perceived support. The questions examine the extent to which the adolescent feels accepted and supported by friends and their ability to form and maintain friendships. In particular, aspects concerning communication with others are considered. Also explored is the extent to which the person experiences positive group feelings and how much he or she feels part of a group and respected by peers and friends.

Respondents were asked 4 questions relating to social support and peer relationships. (Table 24) indicates that (77%) of respondents reported that they have ‘very often’ or ‘always’ spent time with their friends. Also, (77.8%) stated that they have ‘very often’ or ‘always’ had fun with their friends. Similarly, (83.6%) reported that they and their friends have ‘very often’ or ‘always’ helped each other and (45.7%) stated that they have ‘very often’ or ‘always’ been able to rely on their friends.

The Ireland study indicates that (79%) of all respondents reported that they have ‘very often’ or ‘always’ spent time with their friends, and (86%) indicated that they have ‘very often’ or ‘always’ had fun with their friends. Meanwhile, (69%) reported that they and their friends have ‘very often’ or ‘always’ helped each other besides (60%) who perceived that they have ‘very often’ or ‘always’ been able to talk about everything with their friends. Furthermore, (72%) stated that they have ‘very often’ or ‘always’ been able to rely on their friends. Alternatively, on the other end of the scale, (17%) revealed that they have ‘never’ or ‘seldom’ been able to talk about everything with their friends (Keenaghan & Kilroe, 2008).

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have you been able to do things that you want to do in your free time?	14	3.7	22	5.8	103	27.2	69	18.3	170	45.0
Have you had enough time to meet friends?	1	0.3	10	2.6	76	20.1	110	29.1	181	47.9
(1_100)									81.6	

Table 22: Autonomy scale

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have your parents had enough time for you?	15	4.0	31	8.2	108	28.6	88	23.3	136	36.0
Have your parents treated you fairly?	18	4.8	11	2.9	37	9.8	65	17.2	247	65.3
Have you been able to talk to your parents when you are able to do?	15	4.0	18	4.8	59	15.6	75	19.8	211	55.8
(1-100)									82.2	

Table 23: Parent relations and home life scale

School environment: This dimension explores the perception of adolescents about their cognitive capacity, learning and their feelings about school. It includes their satisfaction with their ability and performance at school. Generally, the dimension explores the adolescent's view of their relationship with their teachers. For example, questions include whether they get along well with their teachers, and whether the teachers are perceived as being interested in them as individuals.

Respondents were asked 10 questions about their school environment. (Table 25) indicates that (46.1%) of respondents reported that generally they have been 'very often' or 'always' burdened in study, while (26.8%) of respondents have been 'very often' or 'always' feeling the burden in examinations. About (46.1%) of respondents reported that they have been 'very often' or 'always' burdened in Assignments and or presentations, and (50.3%) of them stated that they have 'very often' or 'always' in lack of time for study.

On similar basis, (65.4%) indicated that they have 'very often' or 'always' felt burden in problems with collages, whilst (55.5%) perceived that they have 'very often' or 'always' been able to pay attention and (47.1%) stated that they have 'very often' or 'always' got along well with their teachers. The other end of the scale shows that (1.3%) only revealed that they have 'never' or 'seldom' felt burden

in isolation at school and (1.9%) indicated that they have 'never' or 'seldom' felt burden in problems with their teachers.

The Ireland study indicates that (52%) of all respondents reported that they have been 'very' or 'extremely' happy at school. (63%) stated that they have got on 'very' or 'extremely' well at school and (46%) indicated that they have been 'very' or 'extremely' satisfied with their teachers. (54%) perceived that they have 'very often' or 'always' been able to pay attention. In the same study, (42%) reported that they have 'very often' or 'always' enjoyed going to school and (55%) stated that they have 'very often' or 'always' got along well with their teachers. It was also revealed that (30%) have 'never' or 'seldom' enjoyed going to school and (24%) indicated that they have been 'not at all' or 'slightly' satisfied with their teachers (Keenaghan & Kilroe, 2008).

As shown above, the questions are different in both studies, but they could reflect the same perception and feelings towards the school.

Money Matter: This dimension deals with money matters and assesses the perceived quality by adolescents with regard to their financial resources. It explores whether the adolescents feel that they have enough financial resources to allow them to live a lifestyle that is comparable to other adolescents, and whether they have enough money for their expenses.

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have you been spending time with your friends?	1	0.3	10	2.6	76	20.1	110	29.1	181	47.9
Have you had fun with your friends?	8	2.1	10	2.6	66	17.5	100	26.5	194	51.3
Have you and your friends helped each other?	2	0.5	7	1.9	53	14.0	95	25.1	221	58.5
Have you been able to rely on your friends?	54	14.3	34	9.0	117	31.0	64	16.9	109	28.8
(1-100)								81		

Table 24: Social support and peers scale

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Have you felt any burden in study in general?	87	23	42	11.1	138	36.5	43	11.4	68	18
Have you felt any burden in exams?	66	17.5	35	9.3	103	27.2	45	11.9	129	34.1
Have you felt any burden in Assignments, presentations?	131	34.7	43	11.4	106	28	33	8.7	65	17.2
Have you felt any burden in lack of time for study?	133	35.2	57	15.1	104	27.5	37	9.8	47	12.4
Problems with fellow students	246	65.1	73	19.3	45	11.9	7	1.9	7	1.9
Have you felt any burden in problems with your teachers?	304	80.4	45	11.9	22	5.8	3	0.8	4	1.1
Have you felt any burden in isolation at school?	343	90.7	8	2.1	22	5.8	2	0.5	3	0.8
Have you been able to pay attention at school?	42	11.1	30	7.9	128	33.9	77	20.4	101	26.7
Have you been able to get along well with your teacher?	8	2.1	13	3.4	64	16.9	62	16.4	231	61.1
(1_100)								76.3		

Table 25: School environment scale

Answer Total=378	Never		Seldom		Quite often		Very often		Always	
	Freq	%	Freq	%	Freq	Freq	%	Freq	%	Freq
Have you had enough money to do same things as your friends?	21	5.6	0	0	0	0	0	0	357	94.4
Have you had enough money for your expense?	29	7.7	14	3.7	11	2.9	104	27.5	220	58.2
(1_100)								90.2		

Table 26: Money matter scale

Respondents were asked 2 questions relating to their financial resources. (Table 26) shows that, (94.4%) of respondents 'very often' or 'always' had enough money to do the same things as their friends, and (85.7%) of them 'very often' or 'always' had enough money for their own expenses.

These results were higher than the Irish study results showing that, overall, (70%) of all respondents 'very often' or 'always' had enough money to do the same things as their friends. On similar trends, (68%) of respondents 'very often' or 'always' had enough money for their expenses and (71%) 'very often' or 'always' had enough money to do things with their friends. The other end of scale shows that (14%) of respondents 'never' or 'seldom' had enough money to do the same things as their friends, and (9%) of them said they did not have enough money to do things with their friends (Keenaghan & Kilroe, 2008).

However, it is worth mentioning that longstanding access restrictions imposed by Israel have undermined the Gaza Strip economy resulting in high levels of unemployment, food insecurity and aid dependence [66]. This justifies that adolescents in Gaza used to live in a low economic situation and suffered from insufficient amount of money to cover their daily life needs; they then have to cope with the poor economic status of their family and trying to show more sympathy with their families and to be satisfied despite the necessity and poverty.

Quality of life total score according to gender: As shown in (Table 27) the total score of money matters domains of QOL among the study population got the highest score (90.2%), while their psychological well-being had the lowest score (66.3%). According to gender, boys showed higher score in all QOL domains, except in money matter where girls got higher score than boys. These results were similar to the Ireland study which shows that girls rated their overall HRQoL across the dimensions as lower than that of boys.

The findings in dimensions relating to psychological well-being and moods and emotions were the lowest scores in the present study (66.3%, 67.1%) respectively. These results are particularly useful in understanding the mental health and well-being of adolescents. Hence, this information can be used as reference data for people working in the area of mental health services and mental health promotion. It will be also useful when comparing population of concern and also exploring the impact of interventions on population groups (Keenaghan & Kilroe, 2008).

In 13 European countries, Kid screen scale was tested but it was noticed that girls were slightly than boys in both samples. In terms of age and sex, the children and adolescents' samples were broadly similar across all participating countries. The most noticeable differences between countries occurred in socioeconomic status (Ravens-Sieberer et al., 2008).

A Corian study reported that generally, girls were found to have a lower HRQOL compared with boys. But the study itself used two dimensions: girls perception of their own body appearance which was more negatively expressed. Girls were more concerned about their looking and their clothes (self-perception). In addition, they reported a lower physical wellbeing than boys [67].

Needless to mention that the summation of QOL total questions scores were computed and re-categorised into poor and good as emphasized in the Table (Table 28).

In (Table 24), the percentage of adolescents who perceived their quality of life as poor are (44.2%), while (55.8%) of them perceived their quality of life as good. Boys perceived their life better than girls as indicated with (60.5%) and (50.3%) for boys and girls respectively.

In a local study about the health-related quality of people living in the Gaza Strip, six months after December, 2008 Israeli attacks, it was found that women reported worse QOL scores compared with men, which is inconsistent with our study, and the difference was statistically significant for the physical domain [68].

HRQOL study in Australian adolescents was associated with gender and age. It appeared that males and younger adolescents were having higher scores than the females and older adolescent's counterparts [69]. It agreed with Japanese study where girls were more likely to have impaired QOL than boys in physical fitness, feelings, social activities, overall health, and quality of life domains. In contrast, girls reported significantly more social support than boys [70].

In contrast, most of the adolescents in a cross sectional survey at British Columbia and Canada (82.3%) agreed or strongly agreed to being satisfied with their QOL [71].

Inferential Statistics Result: This part discusses the relationship between the dependent and independent variables by using some of statistical tests, and it provides an explanation and opinion regarding the findings of this study. The dependent variable for study was quality of life domains to explore the perception of adolescents in

Answer 9 Dimensions Score (0-100)	Total 205 boys	Total 173 girls	Total 378
Physical well-being	83.7	81.6	82.7
Psychological well-being	66.3	66.1	66.3
Moods and emotions	68.7	65.1	67.1
Self-perception	83.3	80.3	82
Autonomy	82	81.2	81.6
Parent relations and home life	82.3	82	82.2
Social support and peers	82.3	79.4	81
School environment	76.4	75.2	76.3
Money matters	89.2	91.5	90.2

Table 27: Total score Quality of Life by Domain according to gender

Category of Quality life	Boy		Girl		Total	
	No.	%	No.	%	N0.	%
Poor	81	39.5	86	49.7	167	44.2
Good	124	60.5	87	50.3	211	55.8
Total	205	100	173	100	378	100

Table 28: Quality of life category according to gender

Gaza strip, the independent variables were, demographical data such as, gender, psychological domain and nutrition status.

Quality of Life according to gender: Gender difference with quality of life domain (Table 29) using chi-square test showed that boys and girls had statistical significant differences in total domain p-value (0.047), girls showed lower percentage (50.3%) in good quality of life than boys (60.5%). The mean of each QOL domain was higher among males, without statistical significant differences except for the domain 'mood and emotion' where difference in the mean was statistically significant (P value less than 0.001).

Quality of life and physical activity: Physical activity differences with quality of life domain 'poor and good' in Table (30) using chi square test showed statistical significant differences with p-value (0.027).

The differences between categories show that where there is increase in activity among adolescents, they will perceive their quality of life as good. It is of interest to note that in a Japanese study, children who participated in physical activity with low frequency had

poor QOL when compared with their active peers (Chen et al, 2005).

The covariates of physical activity and subjective health were positively correlated and also showed a positive and significant association with life satisfaction and SoC (sense of coherence) (Moksnes et al., 2012).

The detailed differences between physical activity and Quality of life domain show statistical differences with Physical wellbeing domain p-value (0.003), Psychological wellbeing p-value (0.030), mood and emotion p-value (0.003), and the other quality of life domain were not statistically significant.

Quality of life according to anthropometric and micronutrients measures: As shown in (Table 31) there was no relation between vitamin D and QOL as good or poor and this was reflected statistically by having no differences between them. However, Iron and Zinc had no statistical differences with QOL, regardless the adolescents with normal iron blood level who had perceived their QOL better than adolescents with deficiency. Adolescents who were not anaemic perceived their QOL better than

Categories Gender	Quality of life		Chi-square
	poor % N=167	good% N=211	
Boys	39.5	60.5	0.047
Girls	49.7	50.3	

Table 29: Relation-ship between quality of life domains according to gender

Categories physical activity	Quality of life		Chi-square
	poor % N=167	good% N=211	
Sedentary	50.0	50.0	0.027*
Low active	38.3	61.7	
Active	35.4	64.6	

Table 30: Chi-square test to measure the relation between quality of life and physical activity categories

Vitamin D	Categories	Quality of life				Chi-square
		Poor N=66		good N=84		
	No.	%	No.	%	Sig	
	Insufficiency	29	43.9	37	56.1	0.989
	Sufficiency	37	44.0	47	56.0	
	Deficient	2	16.7	10	83.3	
Zink	Categories	Poor N=136		good N=164		0.490
		No.	%	No.	%	
	Normal	89	46.8	101	53.2	
	Deficient	47	42.7	63	57.3	
	Categories	Poor N=136		good N=164		0.784
		No.	%	No.	%	
	Normal	103	44.8	127	55.2	
	Deficient	33	47.1	37	52.9	
Body mass index	Categories	Poor N=167		good N=211		0.027
		No.	%	No.	%	
	Under weight	29	33.7	57	66.3	
	Normal	105	45.3	127	54.7	
	Over weight	24	50.0	24	50.0	
	Obese	9	75.0	3	25.0	
HB level	Categories	Poor N=167		good N=211		0.581
		No.	%	No.	%	
	Anaemic	28	47.5	31	52.5	
	Non-Anaemic	139	43.6	180	56.4	

Table 31: Relationship between Quality of life of adolescents with their anthropometric measurements and micronutrient's status

adolescents who were anaemic, but no statistical differences existed between both. The relation between BMI and QoL showed statistical significance p-value (0.027), where the adolescents who have obesity perceived their QoL poorer.

These results agreed with Japanese study which shows that most lifestyle factors were significantly associated with QOL measurement. Also, it showed that obese children and adolescents reported significantly lower health-related QOL in physical, psychosocial, emotional, and social functioning (Chen et al., 2005).

In Australian study, it was found that no association between weight status and self-reported HRQoL. There was also a significant interaction of weight status by gender whereby overweight females had poorer HRQoL relative to healthy weight females (Bolton et al., 2014).

Quality of life and food intake: (Table 32) illustrated that the relation-ship between quality of life domain and food intake shows

statistical differences in fast food with p-value (0.044), vinegary p-value (0.012), spicy p-value (0.000), fried food p-value (0.027), lemonade and soft drink p-value (0.021), chicken meat p-value (0.045) and fish p-value (0.009).

There was no relation with other types of food in accordance with QOL. According to (Carr 2016), eating sugary foods, and even salt (like chips), increases the production of endorphins in the body. Endorphins are basically opiates that make people feel relaxed. So, when they eat these foods and experience this feeling, they want more and this similar to the way drug users get addicted to narcotics. She stated that a recent study shows that sugar can actually have a more intense feeling of reward than cocaine [72]. Moreover, there is some evidence that preference of foods high in fat and sugar may influence opioid releases in the brain as a coping "reward" after a stressful situation which produces behavioural reinforcement [73].

(Table 33) showed adolescents who eat high frequently healthy

Food intake	Categories	Quality of life				Chi-square
		Poor N=167		Good N=211		
		No.	%	No.	%	Sig
Milk	High	45	37.2	76	62.8	0.060
	Low	122	47.5	135	52.5	
Egg	High	116	42.5	157	57.5	0.286
	Low	51	48.6	54	51.4	
Beverages	High	107	42.1	147	57.9	0.250
	Low	60	48.4	64	51.6	
Sweets (chocolate, candy)	High	116	43.1	153	56.9	0.052
	Low	51	46.8	58	53.2	
Cake / cookies	High	107	42	148	58	0.211
	Low	60	48.8	63	51.2	
Chips	High	126	45.7	150	54.3	0.343
	Low	41	40.2	61	59.8	
Chinese Noodles (Endomy)	High	41	53.2	36	46.8	0.073
	Low	126	41.9	175	58.1	
Fast food / canned food (pizza, beef burger)	High	36	35.6	65	64.4	0.044
	Low	131	47.3	146	52.7	
Vinegary food	High	75	52.4	68	47.6	0.012
	Low	92	39.1	143	60.9	
Silly & spicy food	High	102	53.4	89	46.6	0.000
	Low	65	34.8	122	65.2	
Roasted food (Shawerma)	High	63	40.1	94	59.9	0.181
	Low	104	47.1	117	52.9	
Fried food and oil	High	131	47.6	144	52.4	0.027
	Low	36	35.0	67	65.0	
Dried fruit	High	18	47.4	20	52.6	0.676
	Low	149	43.8	191	56.2	
Cooked vegetables	High	117	42.1	161	57.9	0.172
	Low	50	50.0	50	50.0	
Lemonade/soft drinks	High	113	40.6	165	59.4	0.021
	Low	54	54.0	46	46.0	
Meat/sausage products	High	88	40.4	130	59.6	0.081
	Low	79	49.4	81	50.6	
Chicken meat	High	119	41.3	169	58.7	0.045
	Low	48	53.3	42	46.7	
Fish/sea food	High	53	35.8	95	64.2	0.009
	Low	114	49.6	116	50.4	
Dairy/dairy products	High	124	43.2	163	56.8	0.498
	Low	43	47.3	48	52.7	
Cereals	High	99	44.4	124	55.6	0.920
	Low	68	43.9	87	56.1	

Table 32: Relation-ship between quality of life domain and food intake

foods have perceived their QOL better than the adolescents who eat less frequently healthy foods as well the adolescents who eat high frequent of unhealthy food were perceived their QOL better than the adolescent who eat low frequent of unhealthy food with no statistical significance. That's mean the food intake doesn't have effect on the adolescent's quality of life. The details relation between quality of life domain and healthy and unhealthy food was founded not statistically significance with all domain. See Annex (8).

Multivariable analysis of local study conducted by (Yassin et al., 2016) on university students, revealed that frequent consumption of "unhealthy food such as sweets/cookies/snakes/fast food was significantly associated with lower perceived stress among males.

Quality of life and psychological status: As demonstrated by (Table 34), the relationship between adolescent's quality of life and their psychological status shows highly statistical significance (<0.001), where the adolescent who perceived their Psychology as good also perceived their QOL as good.

In contrast to our findings, the results of self-reported physical health status which was filled by adolescents in 49 schools in British Columbia, Canada reported that most of the variance in each of the life satisfaction dimensions could be attributed to the adolescents' self-reported mental health status. Also, (9.5%) of the adolescents who rated their physical health as good or better rated their mental health as fair or poor; and (5.3%) of the adolescents who rated their mental health as good or better rated their physical health as fair or poor (Sawatzky et al., 2010).

Quality of life and psychological status by domain: (Table 35) shows that (74.7%) of adolescents who perceived depressed mood reflected negatively on their quality of life with significant differences

p-value (0.000). As well as adolescent who perceived anxious (68.4%) with significant differences p-value (0.000), un controlled to their psychological behaviour and emotion (44.2%), and their poor psychological wellbeing (47.6%), affected adversely on their quality of life with no significant differences. As seen in annex (1) the mean for each of the QOL domains is higher among those who classifies good than those classified Bad. The differences between the two groups are highly statistically significant (P value < 0.001).

The findings of self-reported physical health status which was filled by adolescents in 49 schools in British Columbia, Canada suggest that, self-reported mental health status is more strongly associated with depressive symptoms and physical health status with physical activity (Sawatzky et al., 2010).

Nutritional Intervention: Format was developed for the nutritional intervention. It contains the main results of nutrition (Haemoglobin, vitamin D, iron, Zinc and body mass index) and its classification into normal and abnormal according the standards. Therapeutic and nutritional management was added to the needed cases. Coordination was done with the School health directorate in the ministry of health to distribute these reports among the schools and insured that all adolescents who participated in the study and got the analysis to receive their results.

Psychological Intervention: Referring to Kessler scale, the results obtained from the questionnaire revealed that 26 adolescents were identified as severe and moderate cases while 114 adolescents were mild. Accordingly, psychological support sessions were conducted for the identified 26 adolescents with moderate-severe psychological distress (20 boys, 6 girls) for 2 days (5 hours/day). Sessions included different activities aimed to break the ice

Food intake	Category	Quality of life		Chi-square Sig
		Poor % N=167	Good % N=211	
Healthy food intake	High frequent	41.8	58.2	0.287
	Low frequent	47.3	52.7	
Unhealthy food intake	40.7	59.3	40.7	0.213
	47.1	52.9	47.1	

Table 33: The relationship between quality of life and food intake category

Categories Psychological	Quality of life		Chi-square Sig
	Poor % N=167	Good% N=211	
Poor	70.3	29.7	0.000
Good	22.3	77.7	

Table 34: Relationship between adolescent's quality of life and their psychological status

Psychological Domains	Categories	Quality of life				
		Poor = 167		Good= 211		
		No	%	No	%	Sig
"Depression"	Depressed	133	74.7	45	25.3	0.000
	Non-Depressed	34	17	166	83	
"Anxiety"	Anxious	119	68.4	55	31.6	0.000
	Not Anxious	48	23.5	156	76.5	
Psychological "Behavioral/ emotional control"	Un Controlled	95	44.2	120	55.8	0.998
	Control	72	44.2	91	55.8	
"Psychological wellbeing"	Poor	91	47.6	100	52.4	0.170
	Good	76	40.6	111	59.4	

Table 35: Relationship between adolescent's quality of life and their psychological status by domain

between participants, communication, and psychological relief through painting, playing games, puzzles, psychodrama, storytelling, relaxation technique, in addition to other activities in order to identify the needed cases for referral.

Based on the report of the psychologist 2 days were not enough to identify cases accurately where at least 5 days recommended. Variation between the adolescents was found according to their interaction, reactions, and impression about the sessions were 2 cases from boys need a referral to a psychologist to be treated for violence and depression. While 4 girls need more sessions.

It's worth to mention that report was submitted about cases to Ministry of education to follow up the identified cases.

Conclusion and Recommendation

Conclusion

Identification and assessment of nutritional and psychological risk factors affecting the life quality of adolescents in the Gaza Strip in order to highlight and prioritize them were achieved. There had been four objectives of this study, the first is to determine and assess the risk factors associated with two different components of life quality of adolescents in the Gaza Strip, the second is to measure the extent of psychological disorders amongst adolescents affected with current life style in Gaza, whilst the third is to study in depth the effect of nutritional status in the Gaza Strip on adolescent's life quality, and the fourth is to identify research gaps and set research priorities for future relevant studies in order to encourage adolescent's behavioural changes.

To achieve these objectives, the present study, utilized quantitative and qualitative measures by incorporating face to face interview questionnaire with adolescents, and focus group discussion with parents and stakeholders. In addition, anthropometric and micronutrients measurements were conducted. Triangulation of data was used in order to ensure credibility of the results. The study results might help improve the adolescent's quality of life in the Gaza Strip via attempts to focus on the main obstacles and problems that the adolescents suffer from.

Based on the study results the following conclusion aims to draw attention to key findings that have implications for policy and services relevant to adolescent's quality of life.

The study findings revealed that (56.3%) of adolescents were eating healthy foods with high frequency, where boys (57.1%) surpassed girls (55.5%). Adolescents eating unhealthy foods were (45.5%) with higher frequency amongst girls (46.8%) than in boys (44.4%). During discussions in the focus groups most of parents mentioned that the life style changes in their sons and daughters regarding food intake is mainly adhered to the start of their adolescence (teenage period). They mentioned also that adolescents know what is the healthy food, its content and importance? But, yet they don't pay attention/take it always importantly.

Regarding anthropometric measurements, (63%) of participants presented with normal height for age, (29%) were mildly stunted, while (7.9%) of them were moderately to

severely stunted. With regards to body mass index, (22.8%) of adolescents were underweight with higher prevalence amongst boys (27.8%) than girls (16.8%).

Furthermore, (3.2%) were obese, girls showed higher obesity rates than in boys (4%) and (2.4%) respectively.

Haemoglobin measures showed (15.6%) of the study adolescents were anaemic, while (84.4%) of them were non anaemic, and (14.1%) of boys were anaemic meanwhile anaemic girls were (17.3%). Moreover, the total percent of vitamin D deficiency was (8%) followed with insufficiency as (35.3%), and the percentages of girls in both items were (16.7%) and (58.3%) respectively, while in boys the corresponding percentages of deficiency and insufficiency were (0.0%) and (14.1%) respectively. Iron deficiency was among (23.3%) of the study participants, of them girls were higher (27.3%) than boys (19.9%). The percentage of zinc deficiency was the highest

among the deficient micronutrients (36.7%) with girls slightly higher than boys as (38.1%), (35.4%) respectively.

It's worth to mention that, more than half of adolescents (57.7%) were living sedentary life, of them girls were (85.5%) higher than boys (34.1%). Differently, (29.9%) of adolescents were active and very active, including (49.8%) of boys compared to only (6.4%) of girls who were active out of the total population. Parents' perceptions about their adolescent's physical activity according to gender were consistent with the results of the questionnaire with adolescents, which revealed that boys practice physical activities more than girls.

The researchers considered four psychological health and well-being dimensions including depression, anxiety, behavioural emotional control, and psychological well-being. The overall domains findings demonstrated that, (47.1%) of adolescent perceived depressed mood where girls were higher than boys. Around (46%) of adolescent were anxious and girls were higher than boys. Girls, with a percentage of (45.1%) were more able to control their behaviour and emotion than boys. About (45.5%) of adolescents reflected poor psychology, while (54.5%) of them reflected good psychology.

Quality of life domain was adopted and modified from KIDSCREEN 52 instrument, this instrument is a European-wide effort, covering 13 countries, where the researchers utilized this instrument for adolescents in the Gaza Strip in order to provide reference data on individual dimensions of the instrument. The findings of this study provide reference data that can be used for improving the adolescents' quality of life. The KIDSCREEN-52 instrument measures 10 health-related quality of life (HRQoL) dimensions, but in this study, one dimension was excluded as being irrelevant to our context (social acceptance and boyfriends' relationships). The other dimensions are addressing the following main areas (physical well-being, psychological well-being, moods and emotions, self-perception, autonomy, parent relations and home life, social support and peers, school environment and money matter). The results illustrated that the total score of money matters domains of QOL among study population had the highest score (90.2%), while their psychological well-being had the lowest score (66.3%). According to gender, boys showed higher score in all QOL domains expect in money matter where girls got higher score than boys. Other findings in dimensions relating to psychological well-being and moods and emotions achieved the lowest scores (66.3%) and (67.1%) respectively. It's worth mentioning that the summation of the QOL total questions' scores were computed and re-categorized into poor and good. The adolescents perceiving poor quality of life were (44.2%), while (55.8%) of them perceived their quality of life as good. Boys perceived their life better than girls (60.5%) compared to (50.3%) of girls.

The relationship between dependent and independent variables demonstrated that boys and girls had statistical significant differences in the total domain (p -value 0.047). In this category, girls showed lower percentage (50.3%) in good quality of life than boys (60.5%). The relationship between quality of life and food intake category showed that adolescents who eat high frequent healthy foods had perceived their QOL better than the adolescents who eat low frequently healthy foods. Surprisingly, adolescents who eat high frequently unhealthy foods had perceived their QOL better than adolescents who eat low frequently unhealthy food (differences were not statistically significant). This means that food intake doesn't have an effect on adolescent's quality of life. Whereas, the relationship between adolescent's quality of life and their psychological status showed high statistical significance ($P < 0.001$), where the adolescents who perceived their Psychology as good also perceived their QOL as good.

Finally, and based on the study results, nutritional and psychological interventions were conducted to adolescents' who participated in the study and recognized as needy cases for the intervention.

As per the study results, unprecedented reference data are now available in the Gaza Strip. They can be used for the purposes of addressing the adolescent's needs and help solving their nutritional

and psychological problems, a matter that would undoubtedly improve their quality of life.

Recommendation

The study has given an opportunity for researchers to provide evidence based achievable recommendations within MOE and MOH capabilities and they include the following;

- Further in depth analysis and valuable utilization of this research's data are highly recommended for future interventions regarding adolescents in Palestine.
- The KIDSCREEN tools should be used in future national health surveys, multidisciplinary research and clinical monitoring. Exploration of the use of tools in and out-of-school settings should also be pursued.
- More study in QoL and micronutrient deficiency among adolescents, should be addressed and conducted responsibly by higher levels of MoH in cooperation with nutritional and public health organizations.
- Awareness sessions on healthy eating for adolescents and parents should be implemented in schools, social media, and national organizations.
- Encouraging physical activities at school level via re-engagement with the early morning sport sessions at schools. Health education sessions addressing the importance of regular physical activity.
- A national plan should be developed by MOE and MOH involving governmental and non-governmental organizations targeting adolescents. It should include three big domains; Quality of life, Psychology wellbeing and nutrition, through health education campaigns and purposeful involvement of adolescents'.
- Starting with adolescents at earlier age, a screening program for micronutrients and anthropometric measures should be conducted aiming at achieving preventive early case detection.
- Psycho social support is needed for all adolescents who showed psychological distress in this study but had no opportunity to share in psychological intervention.

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